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Technical Information Appropriate for Developing Countries

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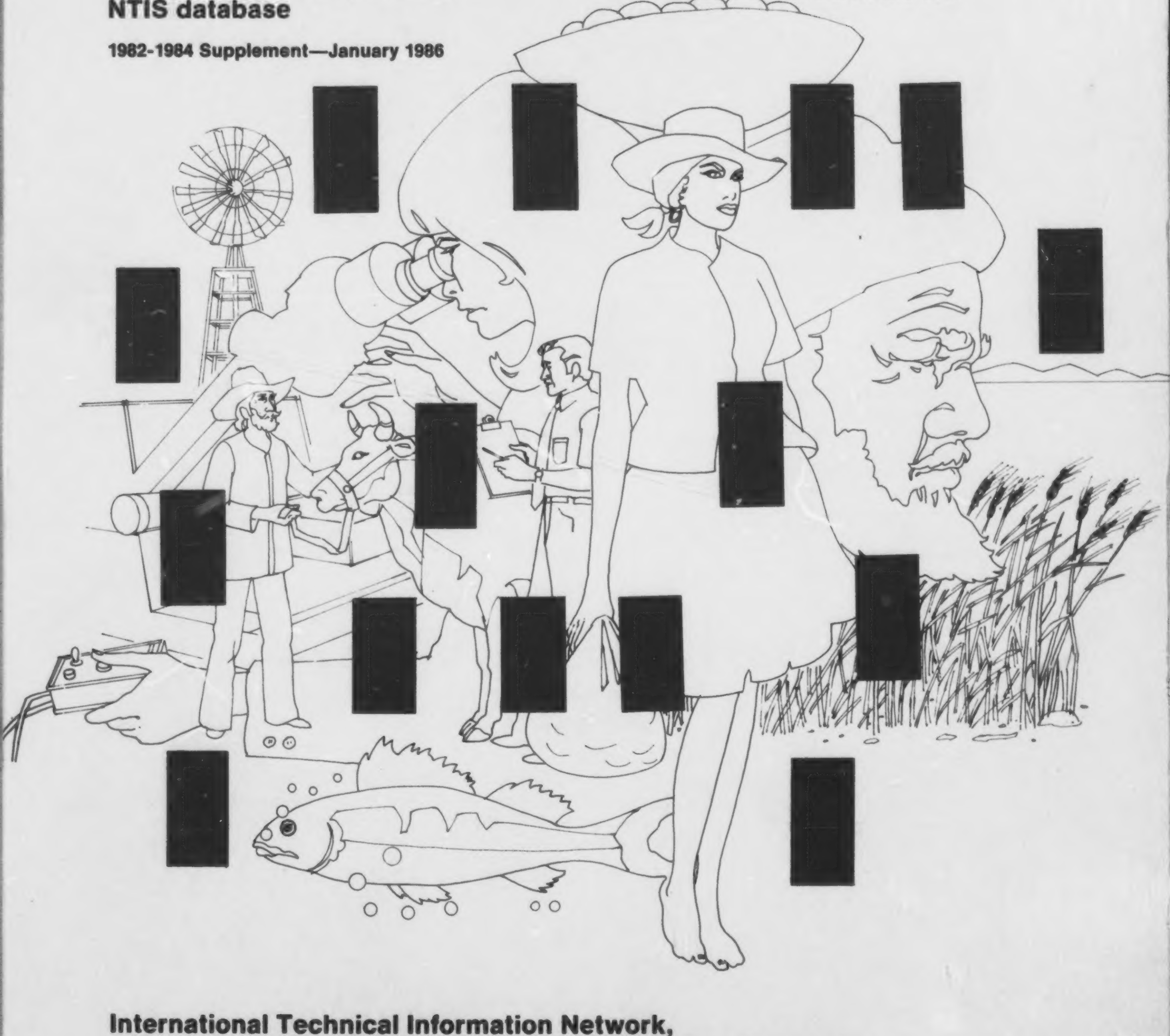

**International Technical Information Network,
A Project of the U.S. Agency for International Development
and the National Technical Information Service**

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ABOUT NTIS

The National Technical Information Service (NTIS) is part of the U.S. Department of Commerce. It is the central source for the public sale of U.S. Government-sponsored scientific and technical research, development and engineering reports and plays a key role in the international exchange of information. In addition, it handles most federally generated, machine processable data files and software programs and it also manages the Federal Software Exchange Center.

NTIS has become a leading participant agency within the Federal establishment in bilateral, regional and worldwide activities involving technology transfer and information. It actively searches for useful foreign technology reports, that are generally not available to the public, and attempts to include them in the NTIS database. Success in this effort can be measured by the fact that, of the *approximately 1.6 million research reports in the NTIS collection,* over 400,000 are based on foreign technology.

Over six million information items are shipped each year, or around 26,000 each day. Approximately *70,000 reports are added to the collection every year* including 20,000 from foreign sources. These reports are the core of the NTIS information system. All are permanently available in microfiche or paper copy and some may be obtained in machine-readable format. NTIS publishes full summaries of these reports in weekly newsletters, a bi-weekly journal, an annual index and in various subscription formats. The data collection itself may be reviewed online via various computer search service companies including DIALOG, BRS, ORBIT and MEAD.

More than 80 periodicals issued by other Federal agencies and not-for-profit organizations are sold or distributed by NTIS. In addition, NTIS is the central source for information about all new U.S. Government-owned patents and patent-pending applications. There are 3,000 different "Published Searches" that represent computer searches performed on 20 Government sponsored and privately produced, foreign and U.S. owned databases.

NTIS sells its technical information products and services under provisions of Title 15 of the U.S. Code (1151-7). This law established NTIS as a clearinghouse for scientific, technical and engineering information and directed it to cover all its expenses through sales. NTIS is a unique U.S. Government agency because it is sustained only by its customers. The costs of NTIS salaries, marketing, postage and all the usual operating expenses are paid from sales income, not tax-supported U.S. Government funds.

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The NTIS Office of International Affairs and the U.S. Agency for International Development work closely together to enhance economic growth in developing countries. AID has recognized that information is a needed component in development and subsidizes an NTIS program to help these countries obtain useful scientific and technical information from the NTIS database.

Working agreements have been reached with over 65 developing and developed world organizations (see back page) for them to act as local NTIS representatives. These organizations help NTIS users obtain fast and efficient service when transacting business with NTIS. They also often serve as a channel for non-U.S. information dissemination. For more information, please contact your local NTIS representative or write directly to:

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REPORT DOCUMENTATION PAGE

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16. Abstract (Limit: 200 words)

This document was created to support the transfer of technology to developing countries. NTIS performed a search of its database for reports placed into the system between 1982-1984 which were determined to be useful in the developing world.

The 1986 edition lists over 2500 citations with abstracts and should be read in conjunction with the 1983 edition of the Bibliography of Appropriate Technology Information for Developing Countries (PB83-113852). Citations were selected for their applicability to local development problems in the Third World. The technology chosen can be adapted and applied to help solve development problems and foster self-reliance among low income groups. Categories cover low and intermediate technologies, labor-intensive technologies, social and management technologies and selected modern technologies. A number of management planning reports are included to assist planning in the countries involved. It was developed for use by business and industry, extension centers, research and educational institutions and consultants and policy planners.

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Appropriate Technology; Intermediate technology; small-scale industry; agriculture; development economics; policy; social and management technologies; developing country application; AID; natural resources.

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AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

January 23, 1986

Dear Colleagues:

The Office of Development Resources for Latin America and the Caribbean and the Office of Technical Support for Asia and the Near East are pleased to join with NTIS in sponsoring the publicaion of Technical Information Appropriate for Developing Countries: 1982-84 Supplement. This volume represents a major effort to increase the use of technical information from the United States in developing countries.

Case studies and evaluation of the utility of this information have demonstrated repeatedly that these reports respond to technical requirements of users in other countries. They are an effective, inexpensive vehicle for transferring technology worth thousands of dollars. Access to and adaptation of these technologies are a large part of what the "information revolution" means in developing countries.

In sponsoring the development of an international network to ease the acquisition of such materials as cited in this volume, AID is responding to expressed needs of developing countires for specially relevant, technical information. As gains are made in social and economic development we expect to see local information agencies expand the range and depth of services made available.

We hope this volume will serve as a useful reference for finding information which will help solve technical problems worldwide.

Sincerely,

Terrence J. Brown
Director
Office of Development Resources
Bureau for Latin America
and the Caribbean

K. H. Sherper

Kenneth H. Sherper
Director
Office of Technical Resources
Bureau for Asia and Near East

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Members of the NTIS/USAID Technical
Information Network.......................Outside Back Cover

INTRODUCTION

This bibliography was created by NTIS as a tool to help transfer technology to the developing world. It lists 2,500 "appropriate technology" NTIS reports that were placed into the NTIS data collection from 1982 to 1984. A previous edition, the 1983 Bibliography of Appropriate Technology for Developing Countries (PB83-113852), listed similar reports which had been included in the NTIS data collection prior to 1982.

The editors' emphasized the concept of "Appropriate Technology" as the key phrase when searching for useful reports for inclusion in this bibliography. The editors also considered comments by previous users about what they felt should be listed in NTIS appropriate technology bibliographies.

The focus of this bibliography differs from previous editions because many organizations or individuals working with, or in, the developing world only consider reports of the basic "how to" nature to be appropriate technology reports. Most NTIS reports do not meet this strict definition since they usually cannot be used directly by the poor for reasons such as language, illiteracy of the poorest in many countries, reports that are too technical, etc. NTIS has therefore oriented this bibliography more to the "technician" who can help "interpret" the reports for the ultimate beneficiaries.

It was decided not only to include "how to" reports in the bibliography but also to include technical reports that were appropriate for the needs of the developing world. Readers of these reports can use some of them to help people who need assistance in their countries; other reports will be more useful as a reference tool to help plan future activities.

This reorientation is best reflected by the additional reports included on management, information systems, applied technology and environmental protection. They are listed together with the more basic reports that cover such themes as small business and rural development. A number of different World Bank studies are listed here because many practical applications are developed after users review these policy reports.

These reports are only a small selection of the 1.7 million technical reports in the NTIS data collection. The editors could not list all the possible useful reports for all possible user sectors in the developing world; in addition, a number of reports are added to the collection every year. We, therefore, strongly recommend you contact the local NTIS agency to locate this additional information. Furthermore, the editors don't presume to preclude or replace the previous Bibliography of Appropriate Technology but rather to complete and complement it. In compiling the document the editors acknowledge the broadly-based user groups and various financial, economic, social and environmental problems faced in developing countries today.

This bibliography can be visualized as a means to transfer technology within a developing country, between developing countries or from developed to developing countries and vice versa. As in the previous bibliography, we believe the more prominent users of this report will be small-scale business men and industrialists, technicians and scientists, extension center agents who can apply the information to current projects and researchers who can adapt the technology to a given sector of the society.

Also included in its presumed audience are educators who can supplement or integrate the information in course work, librarians and information specialists who can integrate it into their reference collections as well as consultants working in development and policy planning. We believe that some of the enclosed cost-intensive or high technology reports will also be useful to large scale regional projects.

The information compiled in this bibliography is broad in scope and generally conforms to one or more of the following nine categories developed as criteria for selection. They are:

> SMALLER-SCALE TECHNOLOGIES
> This is exemplified by construction and farm equipment manufacturing processes and scaled-down industrial plants. Other examples might be a report on a village-level cement plant or information about hand tractors for small farmers.
>
> LABOR-INTENSIVE TECHNOLOGIES
> Reports were chosen about devices and processes which generate employment and rely upon available labor and materials instead of scarce capital for startup and operation.
>
> LOW-COST TECHNOLOGIES
> This includes inexpensive and village-level technologies most appropriate for economically marginal groups in both urban and rural areas. Examples include hand pumps, rabbit raising, simple methods of candle manufacturing, etc.

REVIVED TECHNOLOGIES
This refers to products and processes once used in the industrialized countries which may still be economically beneficial in developing countries. For example, reports have been included on wind mill, certain machine tools, a variety of plant requirements, and industry profiles.

IMPROVED TRADITIONAL TECHNOLOGIES
One example is giving ox carts of traditional dimensions better tires, wheel bearings and a suspension system to improve load capacity and durability. Another is basing a fishing cooperative on indigenous management models.

ALTERNATIVE TECHNOLOGIES AND KNOW-HOW
This includes a broad spectrum of information, from proven age-old practices to modern approaches to problem-solving. An example of this would be the Chinese Barefoot Doctor's Manual, a handbook featuring acupuncture and traditional herbal remedies as well as modern medical practices.

USEFUL SOCIAL AND MANAGEMENT TECHNOLOGIES
This involves relevant information on health systems, education, cooperatives, small business administration, etc.

SELECTED MODERN TECHNOLOGIES
An appropriate solution to a problem often requires the most sophisticated technology. An example would be the latest agricultural research used to develop a special disease-resistant strain of rice, solar energy used to power a remote radio station or program planning methods which can be adapted to a developing country context to meet priority needs.

We hope you will find this bibliography useful to your development efforts and welcome comments or suggestions on ways to improve subsequent editions. Specific examples of direct application of the bibliography or its documents would be particularly helpful for NTIS when preparing the next bibliography.

S. Dickson Tenney   Eireann Carroll

National Technical Information Service
Springfield, Virginia
U.S.A.

HOW TO USE THIS BIBLIOGRAPHY

This report is arranged to help you locate information in your specific field of interest. After you have identified what type of report you want, you should refer to the SUBJECT INDEX which lists "keywords" describing each report. There are approximately 375 keywords in this index.

We have arranged these subject terms so that you, the user, can look for a report under a general descriptive term. In contrast to many bibliographies, you do not need a technical background to work with this publication. Many of the keywords cover different facets of one topic so you only have to have a general knowledge of your subject to find useful reports.

Each keyword is followed by an alpha-numerical listing (first the letters in order, then the numbers) of the report accession numbers and titles. You should then refer to specific documents listed in the ABSTRACT INDEX which follows. The abstracts are also listed in order.

If after reviewing the abstract, you have not found the type of report you need, you can take an additional step to find a useful one. Each abstract includes a listing of descriptors and identifiers. Whenever you locate a star (*) next to a word, you can refer back to the subject index under that term and find a completely different listing of titles under the new keyword.

The reports contained here are only a sample of the entire NTIS collection of 1.7 million reports. NTIS adds an additional 70,000 reports each year to its data collection. Please contact your local NTIS cooperating organization (back page) for assistance in using this bibliography or in locating other useful reports.

There are several other sections in this report. They include:

The CORPORATE AUTHOR INDEX which lists the corporations that prepared the reports included in the bibliography.

The FOREIGN LANGUAGE INDEXES which list the French and Spanish reports contained in the bibliography.

The following is a sample of a typical abstract entry:

ABSTRACT ENTRY

PB83-209247 PC A04/MF A01
Center for Energy and Environment Research,
Caparra Heights, PR Assessment of Solar Energy as an Alternative Energy Source for the Republic of Panama
G.T. Pytlinski and K.G. Soderstrom, 1982
61p Rept no. CEER-S-141
Sponsored in part by Department of Energy, Washington, D.C.

Descriptors: *Solar energy, *Technology Assessment, *Panama

Identifiers: Solar thermal power plants, Solar water heating, Energy sources, Developing country application

The report covers the Panamanian solar energy assessment program; the solar energy resource base in Panama; the scenario of solar energy implementation; solar technology options including solar thermal power systems, photovoltaic systems (utility interface), and solar water heating systems (economics of solar water heating, market penetration, manpower training, and institutional and social considerations); expected impact of solar technologies; and conclusions. The basic conclusion is that all the plants visited in the study could make effective use of solar energy, reducing the use of fossil fuels. There was also plenty of opportunity for private use of solar energy.

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The ACCESSION NUMBERS are on the upper left hand corner of the citation. When ordering, always list the COMPLETE number (including the following letters, i.e. PB84-555555/NAE) of the report you want as NTIS indexes reports by these numbers. You can list the title only but several days delay may occur in handling.

Many accession numbers begin with the letters "PB", the standard code NTIS assigns to documents it enters into the database. Accession numbers other than "PB" often identify the agency that provided the report, i.e., DE=Department of Energy, COM=Department of Commerce, AD or ADA=Department of Defense, N= NASA, etc.

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IBRD-WP-195/GAA
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IBRD-WP-300/GAA
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Funding and Viability of Rural Development Banks.
PB82-260316/GAA
Recent Performance of Rural Financial Markets in Low Income Countries.
PB82-260324/GAA
Training Agricultural Economists for Work in International Development,
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Proceedings of International Workshop on Socioeconomic Constraints to Development of Semi-Arid Tropical Agriculture, 19-23 February 1979, Hyderabad, India,
PB82-260340/GAA
Pilot Sample Survey for Estimating Yield of Cotton in Hissar (Haryana).
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Sampling Methodology for Estimation of Meat Production.
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Indian Agricultural Statistics Research Institute Annual Report 1979: Golden Jubilee Special.
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PB83-167684/GAA

Energy from Biomass: The Implications of Industrial Use of Wood,
PB83-177600/GAA

Energy from Biomass: The Implications of Residential Heating with Wood,
PB83-177626/GAA

Diseno y Ensayo de Vigas de Madera Compuestas (Design and Testing of Box Beam of Partical Boards),
PB83-217281/GAA

Tableros de Virutas Aglomeradas con Cemento Portland (Wood - Portland Cement Particle Boards),
PB83-217646/GAA

Why and How Wood Dries,
PB84-130681/GAA

Promotion of Commercially Less Accepted Species (Timber) of Wood,
PB84-130947/GAA

Promoting the Use of Wood in Construction,
PB84-132000/GAA

Measures to Promote the Use of Wood and Wood Products.
PB84-132034/GAA

Wood Resources and Their Use as Raw Material. Sectorial Studies Series Number 3,
PB84-132109/GAA

Wooden Packaging for Fruit and Vegetable Products,
PB84-165539/GAA

Review of Technology and Technological Development in the Wood and Wood Processing Industry and Its Implications for Developing Countries.
PB84-169069/GAA

Firewood Crops: Shrub and Tree Species for Energy Production - Volume 2.
PB84-176486/GAA

Case Studies on Industrial Processing of Primary Products. Volume 1. Bauxite, Rubber, Tropical Hardwood.
PB84-217611/GAA

Biogasification of Wood.
PB84-237775/GAA

WOOD PRODUCTS

Manual de Resinacion; Sistema: Pica de Corteza (Manual for Extruction of Resin Using the Bark-Peeling Technique).
PB83-103564/GAA

Diseno y Ensayo de Vigas de Madera Compuestas (Design and Testing of Box Beam of Partical Boards),
PB83-217281/GAA

Tableros de Virutas Aglomeradas con Cemento Portland (Wood - Portland Cement Particle Boards),
PB83-217646/GAA

Sales and Distribution Channels for Exporting Southern Forest Products.
PB83-242255/GAA

Mechanical Wood-Processing Industries in Developing Countries. Problems - Causes - Search for Solutions,
PB84-130707/GAA

Measures to Promote the Use of Wood and Wood Products.
PB84-132034/GAA

Value Analysis in the Furniture Industry,
PB84-132190/GAA

Review of Technology and Technological Development in the Wood and Wood Processing Industry and Its Implications for Developing Countries.
PB84-169069/GAA

First World-Wide Study of the Wood and Wood Processing Industries.
PB84-202779/GAA

WOOD WASTES

Energetic and Environmental Aspects of Utilizing Crop and Forest Residues for Biomass Energy. Final Report.
DE83008178/GAA

Biomass-Energized Crop Drier.
DE84000925/GAA

Appropriate Technology Program: Wood Residue for Energy. Final Report.
DE84010458/GAA

Waste and Dust Extraction Systems,
PB84-130673/GAA

WOODEN STRUCTURES

Wooden Bridges: UNIDO'S (United Nations Industrial Development Organization's) Prefabricated Modular System.
PB84-169044/GAA

WOODWORKING

Waste and Dust Extraction Systems,
PB84-130673/GAA

Manual on Jigs for the Furniture Industry,
PB84-131556/GAA

Safety Standards for the Erection and Maintenance of Electrical Installations,
PB84-204890/GAA

Machines and Equipment for Tool Maintenance,
PB84-204932/GAA

ZIMBABWE

US Trade and Development Program. Energy Projects Data Sheets.
DE83001654/GAA

Effect of Cloud-Seeding on Water Stress of Maize,
PB83-113670/GAA

ZINC

Corrosion of Architectural and Structural Metals and Metal Coatings in South Africa.
PB82-185869/GAA

APPROPRIATE TECHNOLOGY ABSTRACTS

AD-A104 261/3/GAA PC A04/MF A01
Army Procurement Research Office, Fort Lee, VA.
Requisites for Contractor Productivity Improvement.
Final rept.,
Wayne V. Zabel, and Monte G. Norton. Jul 81, 58p
Rept no. APRO-81-03

Keywords: *Economic analysis, *Industrial plants, *Management planning, *Productivity, Industrial production, Motivation, Department of Defense, Government procurement, Policies, Defense systems, Operational readiness, Feasibility studies, Cost analysis.

This was an exploratory study designed to investigate the requisites for productivity improvement and the sources and kinds of data available to support productivity measurement and reward procedures. Recommendations were made for improvements in the acquistion area which would create an atmosphere conductive to productivity investments. It was concluded that a major study should be initiated with Tri service and DOD involvement to develop a productivity measurement and reward system. The report contains a comprehensive bibliography of recent articles related to productivity related issues. (Author)

AD-A104 577/2/GAA PC A03/MF A01
Navy Personnel Research and Development Center, San Diego, CA.
Practical Methodology for Identifying Impediments to Productivity.
Technical rept.,
Michael A. White, Leanne Y. Atwater, and Deborah A. Mohr. Aug 81, 33p Rept no. NPRDC-TR-81-18

Keywords: *Industrial plants, *Productivity, Deficiencies, Methodology, Naval shore facilities, Questionnaires, Sampling.

The methodology followed by NAVPERSRANDCEN in conducting an investigation of impediments to productivity at five Navy industrial facilities in 1980 is described in detail. The methodology included unstructured individual interviews, structured group interviews (using the nominal group technique), and open-ended questionnaire. General instructions for conducting interviews, preparing questionnaires, obtaining samples, and evaluating responses are also provided. (Author)

AD-A104 927/9/GAA PC A03/MF A01
Wisconsin Univ.-Madison. Dept. of Computer Sciences.
Performance Analysis of Alternative Database Machine Architectures.
Technical rept.,
Paula B. Hawthorn, and David J. DeWitt. Mar 80, 32p
Rept no. CSTR-383
Contracts DAAG29-79-C-0182, DAAG29-79-C-0165
Sponsored in part by Contract DAAG29-75-C-0024 and Grants NSF-MCS78-01721 and NSF-MCS75-03839.

Keywords: *Computers, *Information systems, Cost effectiveness, Interrogation, Information retrieval, Feasibility studies, Associative processing, Memory devices, Performance(Engineering).

The rapid advances in the development of low-cost computer hardware have led to many proposals for the use of this hardware to improve the performance of database management systems. Usually the design proposals are quite vague about the performance of the system with respect to a given data management application. In this paper, we predict the performance of several of the proposed database management machines with respect to several representative INGRES queries. The systems analyzed in this paper include are associative disks, RAP, CASSM, DBC, DIRECT, and CAFS. We demonstrate that no one database machine is best for executing all types of queries. We will also show that for one class of queries the degree of performance improvement achieved does not warrant use of a database machine. (Author)

AD-A105 201/8/GAA PC A02/MF A01
Massachusetts Univ., Amherst. Dept. of Microbiology.
Genetic and Physiological Control of Protective Antigen Synthesis by Bacillus Anthracis.
Annual progress rept. no. 1, Jul-31 Dec 80,
Curtis B. Thorne. Dec 80, 16p
Contract DAMD17-80-C-0099

Keywords: *Health, *Microbiology, Biosynthesis, Metabolism, Genetics, Physiological effects, Control, Genes.

The primary objective of the research is to improve the yields of protective antigen in culture filtrates of Bacillus anthracis. Genetic and physiological factors controlling the synthesis and accumulation of protective antigen as well as the two other components of toxin are being investigated. The following areas are being pursued: (1) Isolation of mutants altered with respect to amounts of protective antigen and toxin produced; (2) Determining whether toxin-producing strains carry plasmids and/or prophages that might be related to toxin synthesis; (3) Mapping of chromosomal genes; and (4) Assessment of physiological and metabolic factors affecting protective antigen and toxin synthesis and accumulation. Results of experiments to determine whether plasmid DNA is present in lysates of the Weybridge strain are ambiguous. It seems possible that a high molecular weight plasmid may be present. Experiments on induction of the Weybridge strain with ultraviolet light and mitomycin C suggest that the strain is a defective lysogen. Several new phages active on the Weybridge strain have been isolated and they are being tested for transducing activity. The Weybridge strain undergoes spontaneous variation (dissociation) at frequencies apparently much higher than one would expect for ordinary point mutations. Variants have been found that produce less protective antigen than the majority type but thus far none has been found that consistently produces more.

AD-A105 443/6/GAA PC A02/MF A01
Army Inst. of Dental Research, Washington, DC.
Clinical and Laboratory Comparison of Alginate Impression Techniques,
Jeffrey O. Hollinger, Lewis Lorton, and William A. Krantz. 4 Sep 81, 19p

Keywords: Waxes, *Adhesives, Trays, Comparison, Patients, Models, Rim lock tray.

A clinical and laboratory comparison of alginate impression techniques was undertaken. Rim-lock (trademark) trays were modified with a combination of modeling compound, wax, and alginate adhesive. Both the modified and unmodified trays were used to make alginate impressions of either standard laboratory maxillary and mandibular models or maxillary and mandibular arches of dental patients. The stone casts that were subsequently fabricated were evaluated with a measuring microscope and by ten dentists assessing the accuracy of fit of a prepared occlusal plaster index to the stone casts. It was determined that the most accurate stone models could be made from an alginate impression technique using a Rim-lock tray modified with modeling compound and an alginate adhesive. (Author)

AD-A105 901/3/GAA PC A03/MF A01
California Univ., Los Angeles. Graduate School of Management.
Organizational Control Systems and Productivity.
Annual technical rept. no. 1, Jul 80-1 Oct 81,
William G. Ouchi. 1 Oct 81, 33p
Contract N00014-81-K-0035

Keywords: *Management planning, *Electronics, *Japan, United States, Trade off analysis, Semiconductors, Efficiency, Operational effectiveness, Productivity, International trade.

The report discusses recent work in the sponsored research. This includes: (1) the development of the conceptual framework of the research, (2) a brief review of the histories of the United States and Japanese electronics industries, (3) a descriptive, taxonomic study of the two industries to develop a sampling frame, (4) an efficiency model analysis at inter-firm ownership in the electronics industry, (5) an efficiency model analysis of inter-bank relations in the two cultures, and (6) a trade association study. The report concludes with a list of presentations in which the research design and early findings were reported and discussed. (Author)

AD-A106 001/1/GAA PC A04/MF A01
Office of Naval Research, Tokyo Group, APO San Francisco 96503.
Overview of Microbiology Research in Japan, with Notes on Medical History, Education and Health Care.
Scientific mono.,
Jeannine A. Majde. Jul 81, 69p Rept no. ONRT-M5

Keywords: *Microbiology, *Health, *Diseases, Medicine, History, Education, Health, Medical services, China, Japan, Universities, Schools, Health care.

This monograph summarizes the research activities in medical microbiology at 19 leading medical schools and institutes in Japan. An emphasis is placed on ongoing work in infectious diseases and immunology. However, other disciplines including cell biology, physiology, and biochemistry, are covered when encountered. In addition, background notes on the development of medicine in Japan, the medical educational process, and the Japanese health care system are provided. Names and addresses of the researchers whose work is described in the monograph are provided in an Appendix to facilitate communication, and comprehensive indices are included. (Author)

AD-A106 851/9/GAA PC A02/MF A01
General Accounting Office, Washington, DC. Accounting and Financial Management Div.
Data on Small Business--Much is Collected but it Should be Integrated for Better Use.
16 Jul 81, 11p Rept no. GAO/AFMD-81-71

Keywords: United States Government, Policies, Planning programming budgeting, Legislation, Data bases, Research management, Statistical data, Industries, *Small businesses.

Virtually all officials we met with at Federal data gathering agencies and the Small Business Administration recognized the need for a small business data base. In our opinion, data gathering, analysis, and dissemination is a valid and important role for the Federal Government. Unquestionably, a wealth of information exists and is routinely gathered, but is not fully used due to legal and technical problems. The issues of confidentiality and access are being addressed through pending legislative proposals. We believe legislation will be needed to make federally collected data on small businesses more useful for policy analysis while ensuring confidentiality. The technical problems associated with coverage, comparability, errors, and timing are well recognized among the data gathering agencies, SBA, the Office of Federal Statistical Policy and Standards, and OMB. While many of the problems can be overcome, agencies are constrained by limited resources. (Author)

AD-A107 506/8/GAA PC A03/MF A01
Academy of Health Sciences (Army), Fort Sam Houston, TX. Dental Studies Office.
Evaluation of the Effectiveness and Efficiency of Preventive Dentistry Programs: Assessment of the Relationship between Past Dental Experience and Dental Sick Call in the Field.
Final rept. 1 Oct 80-30 Sep 81,
Warren A. Parker, John E. King, and David G. Brunner. Sep 81, 33p Rept no. 81-013

Keywords: *Health, Medical evacuation, Oral diseases, Medical examination, Extraction, Teeth, Diagnosis(Medicine), Drugs, Emergencies, Army personnel, Case studies, Military exercises, Field army, Operational effectiveness, Efficiency.

The relationship between dental sick call during Army field training exercises and prior dental experience of Army personnel was examined by analyzing data on 92 soldiers who reported to field support dental facilities for emergency conditions and data on 97 randomly selected soldiers who participated in the same exercises but did not report for dental emergencies in the field. Approximately 7745 Troops from different units participated over a time period of 117 days in 3 separate field exercises. The findings indicate an annual dental sick call rate of 234 per 1,000 soldiers. Caries was the most frequent cause of the emergencies (41.2%) followed by third molar/pericoronitis (15.9%), defective filling or fractured tooth (11.0%), gingival and peridontal problems (9.3%), and trauma (2.7%). The most frequent primary treatment rendered in the exercises was extraction (20.9% of primary treatment). When considering all treatment, perscription of medications was the most frequent (35.4%). Eighty-four percent (84%) of the patients were returned to duty without further evacuation. The finding most pertinent to the purpose of this study was that significantly more of the control group had completed the requirements of their last Army Oral Health Maintenance Program

(AOHMP). That is, they were given a dental examination during their last birthmonth. The sick call group completed AOHMP requirements in 29.2% of the cases compared to 45.4% for the control.

AD-A107 890/6/GAA PC **A11**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Geotechnical Lab.
Tunnel Cost-Estimating Methods.
Final rept. FY 77-FY 80,
Robert D. Bennett. Oct 81, 243p Rept no. WES/TR/GL-81-10

Keywords: *Tunneling, *Construction, Cost estimates, Computerized simulation, Computer programs.

The Office, Chief of Engineers (OCE), U. S. Army recognized the need for improving capabilities for estimating tunnel costs, improving support design, and overall, making tunnels and cavities more cost competitive with above ground alternatives. Thus, the OCE requested that the U. S. Army Engineer Waterways Experiment Station (WES) conduct a study to develop and verify reliable methods for estimating costs of tunnel construction and establish improved (more cost-effective) methods for design of tunnel and cavity support systems. This report describes an investigation of various tunnel construction cost-estimating techniques. Manual and computer methods are described and compared, important elements of tunnel construction are discussed, and an evaluation is made of the most promising computer cost model, using case histories of three completed tunnels for which good documentation was available. The cost-estimating methods described herein can be used to develop more comprehensive and accurate estimates for tunneling.

AD-A107 966/4/GAA PC **A05**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Role, Function, and Utilization of the Triage Nurse.
Master's thesis,
John D. Maynard. Dec 79, 89p Rept no. AFIT-CI-79-306T-S

Keywords: *Health, *Health manpower, Emergencies, Roles(Behavior), Standards, Job analysis, Personnel management, Literature surveys, Demography, Questionnaires, Medical services, Theses.

A continued need for increase in emergency services by a consumer conscious public has resulted in marked increases in emergency services being given. The resultant increases in service have led to both role expansion and extension for the nurse working in emergency services. Many subspecialties have developed within the speciality of emergency nursing leading to much confusion as to what some of the roles of the nurse actually are. One such expanded/extended role that suffers from such confusion is that of the triage nurse. this study investigated what role triage nurses were actually performing and compared the role to a model role developed from the literature. Fifty-five nurses (fifty nurses and five supervisors) selected as a convenience sample participated in the study. The study was limited to five hospitals having over a 300-bed capacity in one metropolitan city in a mid-western state. (Author)

AD-A108 210/6/GAA PC **A02**/MF **A01**
Army Medical Research Inst. of Infectious Diseases, Frederick, MD.
Effect of Infection on Nutrient Metabolism.
Interim rept.,
Robert W. Wannemacher, Jr. 17 Sep 81, 6p

Keywords: *Health, *Nutrition, Nutrients, Metabolism, Requirements, Vitamins, Amino acids, Lipids, Nitrogen, Carbohydrates, Losses.

Acute clinical illness caused by an infectious process is typically characterized by a catabolic response, which includes loss of body weight, wasting of body protein, anorexia, increased metabolic rate, and negative nitrogen, potassium, phosphorous, magnesium, sulfur, and zinc balances. Part of the catabolic response can be reversed in laboratory animal models by providing an adequate supply of amino acid and calories via oral or intravenous route.

AD-A108 872/3/GAA PC **A02**/MF **A01**
Cornell Univ., Ithaca, NY. Dept. of Agronomy.
Microbial Degradation of Pesticides.
Final rept. Oct 77-Sep 81,
M. Alexander. 30 Nov 81, 18p Rept no. 1
Contract N00014-78-C-0044

Keywords: *Pesticides, Organic phosphorus compounds, Degradation, Metabolites, Bacillus, Pseudomonas, Molecules, Cleavage, Mass spectra.

The pathway of degradation of one organophosphorus insecticide, Dichlorvos, was studied in detail. A microbial enrichment containing principally two pseudomonads and a bacillus, when incubated in a salts solution containing a vitamin supplement and 250 microgram/milliliter Dichlorvos as sole carbon source, could partially degrade the insecticide. At the end of 7 days incubation, much of the parent molecule was still present but biologically formed metabolites were also noted by TLC, GLC, and mass spectral analyses. The presence of dichloroethanol was confirmed, and evidence was also obtained for the presence of 1,1-dichloroethyl acetate, suggesting a mechanism of cleavage whereby the dichlorovinyl leaving group of the molecule is cleaved from the parent molecule. Whether cleavage was chemical, biological or both was not determined. Inorganic phosphate was formed in increasing amounts in a 4-day incubation period, especially in treatments containing a second more utilizable carbon source, implying a cometabolic route for the degradation of Dichlorvos. Evidence for biological demethylation was also obtained. The results provide evidence for a microbial role in the transformation in conjunction with chemical hydrolysis of Dichlorvos. (Author)

AD-A109 612/2/GAA PC **A02**/MF **A01**
Institute for Medical Research, San Jose, CA. Neuroskeltal Transplantation Lab.
Transplantation of Human Skull and Dura Mater.
Final rept.,
Donald J. Prolo. 15 Dec 80, 8p
Contract N00014-76-C-0621

Keywords: *Health, Humans, Healing, Freezing, Preservation, Dura mater.

Over the past five years investigators at the Neuroskeletal Transplantation Laboratory, The Institute for Medical Research, San Jose, California, have studied the transplantation of human and animal skull and dura mater. Our goals have been the following: to understand the healing of fresh and preserved (frozen) autogenous human skull; to investigate the mechanisms by which autogenous and allogeneic canine skull becomes incorporated into host cranium; to modify allogeneic skull implants in order that repair be augmented; to develop an allogeneic malleable skull implant for universal use in human cranioplasty; to further the clinical application of allogeneic human bone, dura mater and fascia lata by providing a research base for progress in the transplantation of these tissues; to maintain a human tissue bank for clinical distribution of bone, dura mater and fasia lata; to participate in the formation of standards for the banking of human musculoskeletal tissue; to disseminate knowledge of tissue banking to neurosurgeons as primary providers and utilizers of transplantable tissue.

AD-A109 824/3/GAA PC **A03**/MF **A01**
RAND Corp., Santa Monica, CA.
Evaluation of Technology R&D: A Continuing Dilemma,
Peter deLeon. Aug 81, 32p* Rept no. RAND/P-6655

Keywords: *Technology transfer, Decision making, Goal programming, *Management planning, Evolution(Development), Standards, Resource management, Social welfare, State of the art, *Research and development.

The development of new and advanced technologies, especially those with significant potential social effects, needs to be assessed as part of an on-going process. This paper proposes a technology evaluation agenda for the next decade with special emphasis on four issues: appropriate technology R&D standards and criteria; the institutional context; comparisons to alternative options; and the social effects.

AD-A109 946/4/GAA PC **A06**/MF **A01**
Office of the Secretary of the Army, Washington, DC.
Interrelationships of Technology, System Performance, and Prices for Mini/Midicomputers,
Edward H. Yates. Aug 80, 101p
Presented at the Sixteenth Annual DOD Cost Analysis Symposium, 5 Oct 81, Arlington, VA.

Keywords: *Computers, Costs, Performance(Engineering), State of the art, Military applications, Correlation techniques, Military requirements, Trade off analysis, Statistical data.

A study has been performed on the interrelationships of technology, prices, and performance of mini/midicomputers. The key functional characteristics and prices of 203 commercial and 13 military processors from 46 different manufacturers were compiled and analyzed. Multiple correlations among technology, performance characteristics, and prices were conducted by using RAND Corporation multi-form regression analysis program called Curves. Although the variance statistics were somewhat poor, cost estimating relationships were developed from the data which can be used to estimate the 'industry average' price of new mini-midicomputer configurations. Differences between commercial and military versions are discussed. Typical military specifications are presented which show why military computers cost from 2 to 2.5 times more than their commercial counterparts.

AD-A110 326/6/GAA PC **A12**/MF **A01**
Battelle Columbus Labs., OH.
Computer Aided Design and Manufacturing (CAD/CAM) Techniques for Optimum Preform and Finish Forging of Spiral Bevel Gears.
Final rept. Jun 79-Apr 81 on Phase 1,
T. Schultes, P. S. Raghupathi, Taylan Altan, A. Badawy, and T. Wassel. Aug 81, 260p TACOM-TR-12586
Contract DAAK30-79-C-0071

Keywords: *Computers, *Industrial plants, *Forging, Mechanical properties, Rates, Friction, Shear stresses, Gears, Billets(Materials), Shear properties, Input, Optimization, Spiral bevel gears.

In Phase I of this program, a general purpose CAD/CAM techniques was developed for producing precision-forging dies for the family of spiral bevel gears. This CAD/CAM method uses the following input data: The specifications and overall dimensions of the spiral bevel gear to be produced; Data on billet material under forging conditions; Friction shear factor, describing the friction shear stress at die-material interface; and Forging conditions, i.e, temperatures and deformation rates.

AD-A111 283/8/GAA PC **A05**/MF **A01**
Old (Bruce S.) Associates, Inc., Concord, MA.
Return on Investment in Basic Research. Exploring a Methodology.
Final rept. 1979-1982,
Bruce S. Old. Nov 81, 76p
Contract N00014-79-C-0192

Keywords: *Research and development, *Management planning, Decision making, Naval procurement, Contracts, Computers, Systems engineering, Computerized simulation, Naval research laboratories, Nuclear engineering, Nuclear physics, Universities, Benefits, Learning, Training, National defense, Industries, Defense posture, Military posture.

Basic research funding in universities and industry, first undertaken by the U.S. Government through the Office of Naval Research beginning in 1946, is shown to have provided a very large return on investment through positive influences on knowledge developed and applied, people trained and their career contributions, new companies and industries formed, and major new contributions to national defense posture.

AD-A111 311/7/GAA PC **A08**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Systems and Logistics.
Productivity Measurement in Research and Development Laboratories.
Master's thesis,
Thomas A. Fauth. Sep 81, 164p Rept no. AFIT-LSSR-87-81

Keywords: *Research and development, *Productivity, Production control, Military research, Laboratories, Technology forecasting, Literature surveys, Policies, Theses.

This investigation consisted of a theoretical and empirical literature search and an extensive telephone interview process to identify the state-of-the-art R&D productivity indicators. The literature search (of publications from 1960 to the present) resulted in a chronological presentation of theoretical and empirical R&D productivity measurement methodologies and an expanded bibliography. The telephone interview process surveyed 14 Air Force, 30 Army, 20 Navy, and 21 industry laboratories. Specific literature and interview objective and subjective R&D productivity measurement indicators were identified and compared. Both objective and subjective productivity indicators were identified as the primary means of measuring laboratory productivity in the literature (empirical combined government and industry - 59%, theoretical combined government and industry - 46%) and from the interviews (government - 92%, industry - 62%). Status versus milestones, the degree technical objectives are reached, expenditures versus budget, and periodic reviews were the most common (of a standardized list of 18) indicators to both government and industry laboratories. Effectiveness is perceived as a more important component of productivity than efficiency.

AD-A111 657/3/GAA PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Program Analysis Div.
Regulatory Effects on R/D are Better Assessed as Part of the Innovation Process.
11 Feb 82, 52p Rept no. GAO/PAD-82-1
Report to Senator Lloyd Bentsen, United States Senate.

Keywords: *Productivity, *Research and development, *Industrial plants, Regulations, Industrial research, Investments, Costs, Industrial production, Marketing, Standards, Environmental protection, Public safety, Public health, Policies, Pharmacies, Inventions.

Slow productivity growth has prompted concern that Federal regulations may be adversely affecting research and development (R/D) -- one part of the innovation process. GAO reviewed numerous studies of effects of Federal environmental, safety, and health regulations on R/D and innovation. These studies indicate that investment in innovation activities depends on the expected profits the innovation will produce. Anything that tends to lengthen the time before benefits can be realized, limit those benefits, or increase the cost of investment, tends to reduce the rate of return to innovation, and therefore can reduce the amount of R/D performed. Regulation can do all of these things. Whether the costs and benefits of regulation are positive to society depends on the value placed on the Federal policy goals that regulations attempt to achieve as against the goals implicit in a relatively free market. (Author)

AD-A112 298/5/GAA PC **A03**/MF **A01**
Construction Engineering Research Lab. (Army), Champaign, IL.
Organization and Management of Construction in Developing Countries,
Maria Pavlidou. Feb 82, 45p

Keywords: *Management techniques, *Industrial development, *Economic analysis, *Construction, Industries, Work, Jobs, Housings, Organizations, International trade, Perception(Psychology), Human factors engineering, Imports, India, Malta, Rumania, Turkey, South Africa, West Indies, Army research.

Discussion covers organizational forms for construction in developing countries; management of design, the firm, and the project; the influence of human factors; the role of mass housing and industrialized construction; and specific practices in India, Malta, Rumania, Turkey, South Africa, and the West Indies. (Author)

AD-A113 043/4/GAA PC **A02**/MF **A01**
Indiana Univ. at Bloomington. School of Medicine.
Sleep Deprivation and Exercise Tolerance.
Annual rept. 1 Feb 81-31 Jan 82,
Bruce J. Martin. Jan 82, 10p
Contract DAMD17-81-C-1023

Keywords: *Health, Physiological effects, Endurance(Physiology), Oxygen consumption, Heart rate, Metabolism, Work, rates.

The purpose of the study is to identify the effects of sleep deprivation on the ability of humans to tolerate standard forms of endurance exercise. Standard techniques in human exercise physiology are utilized. To date, the results indicate that acute sleep loss of 30 to 36 hours (a) does not alter the maximal oxygen uptake, while it does reduce maximal heart rate; (b) leaves metabolic rate during exercise at a constant external work load unchanged, while heart rate is reduced and ratings of perceived exertion are elevated; (c) reduces tolerance of prolonged heavy exercise at three-fourths of the maximal oxygen uptake by about 10%, with wide variation noted among individuals, and (d) fails to significantly change work loads selected for equal effort during short-term heavy exercise. (Author)

AD-A113 658/9/GAA PC **A13**/MF **A01**
Carnegie-Mellon Univ., Pittsburgh, PA. Dept. of Social Science.
Symposium on Information Processing in Organizations.
Final rept. Oct 81-Apr 82,
Lee S. Sproull, and Patrick D. Larkey. Apr 82, 286p
Grant N00014-82-G-0004

Keywords: *Research and development, *Computers, *Information systems, Organizations, Management, Data processing, Optimization, Computer applications, Planning programming budgeting, Public address systems, Voice communications, Symposia, Reports.

A two-day symposium was held at Carnegie-Mellon University in October 1981 to bring together social scientists doing research in the area of information processing in organizations. The eight papers were presented and discussed in detail include: The maximization process under uncertainty, Information systems in organizations, Formulating and justifying budget problems, Communicating with people in emergencies, Gossip, information and decision making, An on-going case study in technological innovation, Information and ambiguity in organizational change, The nature of managerial attention.

AD-A113 724/9/GAA PC **A03**/MF **A01**
National Research Council, Washington, DC. Committee on Hearing, Bioacoustics and Biomechanics.
Prenatal Effects of Exposure to High-Level Noise,
William D. Neff. Mar 82, 33p
Contract N00014-80-C-0159

Keywords: *Health, Ear, Intensity, High rate, Humans, Fetus, Heart rate, Exposure(Physiology), Laboratory animals, Embryos, Acoustic attenuation, Uterus, Prenatal effects.

The U.S. Air Force asked the Committee on Hearing, Bioacoustics, and Biomechanics (CHABA) to respond to three specific questions regarding the effects on the embryos or fetuses of pregnant women exposed to high-intensity noise. The questions asked were: (1) What are the potential hazards of noise exposure; (2) On the basis of current knowledge, can reasonable limits be specified for conditions of noise exposure; and (3) What research efforts, if any, should be encouraged in order to obtain better answers to the first two questions. The Air Force request was endorsed by representatives of the National Institute of Occupational Safety and Health (NIOSH) and the Environmental Protection Agency (EPA). The Committee on Hearing, Bioacoustics, and Biomechanics appointed Working Group 85 to consider the questions raised by the Air Force. The following brief report reviews the research considered relevant by the working group, points out the problems and limitations encountered in this research and its evaluation, and concludes that on the basis of available data definite answers cannot be given to questions (1) and (2). Recommendations are made for further research. (Author)

AD-A114 066/4/GAA MF **A01**
Construction Engineering Research Lab. (Army), Champaign, IL.
Directory of Construction Engineering Programs in Organization and Management of Construction.
Mar 82, 108p*
Availability: Microfiche copies only.

Keywords: *Construction, *Management planning, *Education, Civil engineering, Surveys.

This second edition of a directory of education programs in engineering and management covers 55 programs in 30 countries. CIB Working Commission 65, Organization and Management of Construction, plans to update the directory periodically, (Author)

AD-A114 200/9/GAA PC **A02**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Diet and Physical Performance: Water and Salt,
Roger W. Hubbard. 29 Mar 82, 9p Rept no. USARIEM-M22/82
Presented at the Annual Meeting of the Research and Development Associates for Military Food and Packaging, Inc. (36th), 6 Apr 82, Chicago, IL.

Keywords: *Health, *Potable water, Water, Salts, Heat, Physical fitness, Physiological effects, Sodium, Sodium chloride, Perspiration.

Ammunition can be defined as any material used to attack or defend a position. If that position happens to include a battle against the hot and arid climate, then the primary ammunition will be water (1). Sun Tzu (a 6th century B.C. Chinese general and military theorist) put it quite succinctly when he said: 'An Army that does not suffer from 100 diseases is said to be certain of victory.' Heat illness is no respector of rank nor numbers. It is to the advantage of all concerned with the performance of US Forces on the modern battlefield to recognize the potentially devastating impact that heat injuries can produce. Adequate water intake is a singularly important factor in avoiding heat injury (2). The misconception that dehydration toughens up the troops was prevalent in the early days of WWII. T.F. Whayne (3) reported* 'Line officers believed in 'water discipline' and it was thought that the drinking of water during work in the heat was harmful. Many shared the conviction that men could be trained to work in the heat on intakes of water that became lower each day, until the ideal 'desert fighter' was developed who could fight on a pint of water a day. We now know that this concept is a myth'. (Author)

AD-A114 213/2/GAA PC **A03**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Effects of Cigarette Smoking on Body Weight, Energy Expenditure, Appetite and Endocrine Function,
Richard L. Burse, Ralph F. Goldman, Elliot Danforth, Jr., Edward S. Horton, and Ethan A. H. Sims. Mar 82, 29p Rept no. USARIEM-M25/82

Keywords: *Health, Energy consumption, Appetite, Endocrine glands, Response(Biology), Metabolism, Ratings, Heart rate, PE61101A.

It is a common belief that people tend to gain weight on stopping smoking. For fear of gaining weight they may continue to smoke and thus retain a significant risk factor for cardiovascular and pulmonary disease. We have studied 4 lean young men who habitually smoked a pack of cigarettes a day. Food intake was kept constant throughout the study, which incorporated periods of smoking and non-smoking in an on-off-on design. The relative importance of change in hunger, in hormonal responses, plasma substrate concentrations, appetite and metabolic rate were thus assessed. Only small, statistically insignificant fluctuations in weight occurred during the course of the study. In 3 of 4 subjects, weight was increased during the period of non-smoking by 0.9 kg and decreased after resumption of smoking by 1.2 kg. During standardized walking exercise in the non-smoking period, the heart rate was significantly lower than during the periods of smoking. There were no changes in resting or walking metabolic rate observed to support any significant decrease in energy expenditure during the non-smoking period. Appetite ratings nearly doubled ($p < 0.01$ at that time, however. The TSH response to TRH was significantly suppressed during the two periods of smoking, which may reflect a central effect of smoking; the response of prolactin to TRH was not affected.

AD-A114 649/7/GAA PC **A03**/MF **A01**
Association of Scientists and Engineers of the Naval Sea Systems Command, Washington, DC.
Technology and Taxes,
Franz A. P. Frisch. 1982, 36p

Keywords: *Economic analysis, *Taxes, *Industrial development, Decision making, Investments, Industries, Manufacturing, Motivation, Profits, Losses, Costs, Technology forecasting, Replacement, Value, Economic models, Econometrics.

Technology is placed in the clusters of the industrial base and the clusters are defined. The clusters are blended with different sets of economic condition and the preservation of earning power established as the objective function for any investment. The link between the clusters, the environment and the objective function is established through taxes and the tax impact on depreciation time and replacement value is analyzed. This analysis is used to discuss the decision process for industrial-technological investment. The observations made in the analysis are summarized and suggestions are made on how to respond to reality.

AD-A115 140/6/GAA PC **A06**/MF **A01**
National Research Council, Washington, DC. Ad Hoc Committee on Computing Resources and Facilities for Ocean Circulation.
International Developments in Computer Science.
Technical rept. 15 Jan-15 Oct 81,
F. E. Allen, J. T. Schwartz, I. L. Auerbach, E. Baark, and B. Berner. 1 Jun 82, 110p Rept no. TR-001
Contract N00014-81-C-0274

Keywords: *Computers, *Technology transfer, Global, *International trade, Developing nations, Japan, Western Europe, USSR, China, Latin America, Literature surveys, Bibliographies.

This is a survey of developments in computer science in five areas of the world outside the United States with principal emphasis on Japan. Most of the information was obtained from documents and other sources available in the United States. The one exception is the trip report of three authors who visited Japan in October 1981. (Author)

AD-A116 081/1/GAA PC **A06**/MF **A01**
VMI Research Labs., Lexington, VA.
Mathematical Modeling for Evaluation of Field Water Supply Alternatives (Arid and Semi-Arid Regions).
Final rept. 1 Aug 79-31 Jan 81,
J. M. Morgan, Jr., J. R. Sculley, V. J. Ciccone, D. K. Jamison, and J. W. Knapp. Jan 81, 107p
Contract DAMD17-79-C-9114

Keywords: *Potable water, *Water supply, Corps level organizations, Military requirements, Army, Health, Purification, Transportation, Storage, Costs, Logistics support, Deserts, Distribution, Waste water, Water treatment.

A mathematical model has been developed which can be applied to evaluate the least-cost alternatives to meet the projected potable and non-potable water requirements of a US Army Corps-sized operation. It included the adaptation of the model to an existing solution technique, the Out-of-Kilter Algorithm (OKA), a search of the literature to obtain cost data for the various elements within the alternatives, a search of the literature for health and other related factors, a review of existing scenarios, a review of collateral issues pertinent to the production of water in an arid or semi-arid environment, and finally, proposed systems for the reuse of laundry and shower wastewaters. (Author)

AD-A118 139/5/GAA PC **A04**/MF **A01**
California Univ., Los Angeles. Graduate School of Management.
Internal Production versus External Exchange - A Proposal for an Empirical Test of the Transaction Cost Model.
Interim technical rept.,
Guido Krickx. Apr 82, 71p Rept no. TR-ONR-3
Contract N00014-81-K-0035

Keywords: *Industrial development, *Marketing, *Economic analysis, Manufacturing, Commodities, Supplies, Internal, Exchange, External, Acquisition, Motivation, Industries, Decision making, Efficiency, Cost analysis, Hypotheses, Transactions.

In this paper a theoretical model is proposed, that allows investigation of why certain organizations manufacture goods internally, while other organizations seek to get supply from other companies. The transaction cost model elaborated here, explains how the characteristics of the production or exchange requirements affect this choice. A number of hypotheses are derived out of this model and an approach to empirically test these hypotheses is proposed and elaborated. (Author)

AD-A118 879/6/GAA PC **A07**/MF **A01**
Alpha Omega Group, Inc., Silver Spring, MD.
Development of a User-Oriented Data Classification for Information System Design Methodology.
Final rept. 1 Jan-30 Jun 82.
30 Jun 82, 130p Rept no. AOG82-ONR-1
Contract N00014-82-C-0129

Keywords: *Information systems, *Computers, Configuration management, Systems engineering, Requirements, Data acquisition, Data processing, Methodology, User needs, Computer aided instruction, Data bases.

A comprehensive review of information system design methodologies demonstrates that there is a need for new and improved approaches, particularly in the early stages of system design. Specifically, a methodology is needed that will collect and organize data from and about the information environment in order to present a coherent, systematic, and dynamic picture of an enterprise and its activities that will support the development of requirements statements, and later, database and data dictionary design and/or use.

AD-A118 949/7/GAA PC **A08**/MF **A01**
Business Innovations, Inc., Alexandria, VA.
Utility of Quality Circles in United States Manufacturing Companies.
Final rept. 1 Jan-31 Jul 82,
Stephen E. Harper, and Gary L. Jordan. 31 Jul 82, 175p Rept no. 4
Contract N00014-82-C-0139

Keywords: *Employee participation, *Industrial plants, *Productivity, Resource management, Production control, Management, Decision making, Employee relations, Industrial personnel, Labor unions, Job satisfaction, Scheduling, Manpower utilization, Manhours, Training, Questionnaires, Operational effectiveness, Industries, Quality circles.

This research provides a systematic study of factors affecting the utility of quality circles as a technique for improving productivity. The results provide information useful for developing techniques to make optimal use of Navy personnel resources. Quality circles were established in organizations which differ in their work activities, their unionization, and their existing management practices. The effect of quality circles was examined and compared to matched work settings in which no quality circles were established. The work included the establishment and training of comparable quality control circles in each of 16 different work settings; the assessment of productivity and organizational effectiveness gains over matched groups in which no intervention was undertaken via a measure of productivity related and management-employee interaction patterns after three months of quality control circle operation. (Author)

AD-A119 073/5/GAA PC **A03**/MF **A01**
Alfred P. Sloan School of Management, Cambridge, MA.
Work and Family: Testing the Assumptions.
Interim technical rept.,
Lotte Bailyn. Aug 82, 29p Rept no. TR-ONR-8
Contract N00014-80-C-0905

Keywords: *Employment, Careers, Culture, Patterns.

Despite widespread awareness of changing patterns of work/family relations, career procedures in organizations are still not responding adequately to this change. The response is inadequate because the working conceptions on which it is based remain traditional. This paper outlines 6 such traditional assumptions, which are patterned around the notion of homogeneity. It then considers the way new career procedures, based on an assumptive pattern of pluralism, might be negotiated. (Author)

AD-A119 265/7/GAA MF **A01**
Washington Univ., Seattle. Graduate School of Business Administration.
Situational Interview: Examining What People Say Versus What They Do Versus What They Have Done.
Technical rept.,
Gary P. Latham, and Lise M. Saari. Jun 82, 37p Rept no. TR-GS-16
Contract N00014-79-C-0680
Availability: Microfiche copies only.

Keywords: *Employee participation, *Employment, Job analysis, Personnel, Questionnaires, Performance(Human), Jobs, Behavior, Predictions, Recruiting, Ratings, Supervisors, Data acquisition, Validation, Employee relations, Statistical analysis.

Two studies were conducted to test the validity of the situational interview. In the first study, a concurrent validity strategy showed that there is a correlation between what people in an interview setting say they do on the job and what they actually do on the job as reported by both peers and supervisors. Furthermore, a situational approach to interviewing appears preferable to asking people direct questions about their past experiences. The second study used a predictive validity strategy to test the theoretical premise of the situational interview, namely, that intentions predict behavior. (Author)

AD-A119 413/3/GAA PC **A03**/MF **A01**
Oregon Univ., Eugene. Graduate School of Mangement.
Facilitating Effective Performance Appraisals: The Role of Employee Commitment and Organizational Climate.
Technical rept.,
Richard M. Steers, and Thomas W. Lee. Aug 82, 26p Rept no. TR-10-ONR
Contract N00014-81-K-0026

Keywords: *Project evaluation, *Employment, *Employee participation, Employee relations, Organizations, Environments, Participative management, Job training, Motivation, Social communication, Performance appraisals.

Previous research on performance appraisals has primarily concerned the reliability and validity of measurement instruments and techniques. Very little research has dealt with the milieu where the actual performance appraisal occurs. In order to help remedy this situation, a conceptual model is presented which highlights the interactive relationships among employee commitment, organizational climate, and performance appraisal systems. The model addresses four key issues: what are the organization's objectives in the appraisal system; what conditions facilitate or inhibit the accomplishment of these objectives; how do employee commitment and organizational climate affect these conditions; and what reciprocal relationships appear likely. (Author)

AD-A119 680/7/GAA PC **A14**/MF **A01**
Vector Research, Inc., Ann Arbor, MI.
Exploratory Research on Personnel Long Range Planning.
Technical rept. 1 Jan-15 May 82,
Seth Bonder, Timothy Doyle, George Miller, and Joyce Shields. May 82, 312p VRI-ARI-7.1-QRR82-1, ARI-RN-82-23
Contract MDA903-81-C-0579

Keywords: *Management techniques, *Employment, Army planning, Long range(Time), Careers, Models, Enlisted personnel, Military requirements, Recruiting, Army training, Deployment, Tables(Data), Distribution, Statistical data.

The objective of this exploratory quick-response research project was to identify personnel-related research, data needs, and method developments required to support long range planning in the personnel area. This objective was accomplished by performing three main tasks: A conceptual analysis of personnel planning was performed to determine the kinds of information that should be included in a personnel long range plan (PLRP); A demonstration personnel long range planning exercise was conducted to determine if the information specified in task (1) could be generated and had utility; and The demonstration planning exercise was evaluated to identify research needs, data deficiencies, and method developments required to support effective personnel planning. Output of the project included research needs to support personnel long range planning, a pilot personnel long range planning system, and a demonstration personnel long range plan. (Author)

AD-A119 736/7/GAA PC **A04**/MF **A01**
Army War Coll., Carlisle Barracks, PA.
Information Engineering.
Student concept paper,
William W. Witt. 1982, 75p

Keywords: *Information systems, Military operations, Models, Management, Flow, Strategy, Organizations, Variables, Military applications, Army operations, Efficiency, Time.

This paper explains the critical nature of information flow in organizations using a 'Living Systems' model. It calls for new ways to manage information flow with a recognition that the 'chain of command' cannot be the sole flow channel if effectiveness is the desired outcome. Also discussed is leadership in the context of 'turning information into action'.(Author)

AD-A119 754/0/GAA PC **A04**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Productivity Improvement for Engineers.
Master's thesis,
Ronald Joe Calloway. Aug 81, 70p Rept no. AFIT/CI/NR-81-38T

Keywords: *Productivity, Engineering, Skills, Measurement.

The purpose of this paper is to develop a methodical approach to understanding and improving the productivity of an engineering workforce within an organization. Engineering workforce is, for the purpose of this paper, defined as those individuals that use engineering skills to conceive, design, and/or implement products, systems, or processes in other than research and development environments. Measurement of productivity, although very much related, is taken to be a separate issue and will not be addressed. (Author)

AD-A119 790/4/GAA PC **A03**/MF **A01**
Houston Univ., TX. Dept. of Psychology.
Perceived Punishment and Reward Values Assigned to Supervisor Actions.
Technical rept.,
Allan P. Jones, and Marianne Tait. 1 Apr 82, 37p
Rept no. J-ONR-82-1
Contract N00014-81-K-0824

Keywords: *Employment, *Management techniques, Perception(Psychology), Personnel, Supervisors.

The study investigated employee perceptions about the reward or punishment values inherent in a variety of supervisor actions. Actions viewed as most rewarding were generally actions which possessed: (a) public visibility, (b) tangibility, (c) implied esteem, and (d) long-term implications. Analyses of action viewed as punishing or aversive involved the following characteristics: (a) personal punishment reflecting informal acts with short-term consequences, (b) tangibility, (c) visibility, and (d) withholding of resources and information. Visibility appeared to be most strongly related to perceived severity. In contrast with suggestions in the literature (cf. Leon, 1981) substantial levels of agreement among raters were found for aversive as well as rewarding actions. Also reviewed are characteristics of leader actions that received mixed ratings from respondents. (Author)

AD-A119 899/3/GAA PC **A03**/MF **A01**
Nebraska Univ.-Lincoln. Dept. of Management.
Idiographic Study of Leadership Behavior in Natural Settings: An Empirical Analysis Using a Single Case Experimental Design.
Interim rept.,
Tim R. V. Davis, and Fred Luthans. Aug 82, 39p
Rept no. 11
Contract N00014-80-C-0554
Prepared in cooperation with Cleveland State Univ., OH. Report on Studies in Leadership and Organizational Behavior.

Keywords: *Management techniques, *Employment, Organizations, Management, Theory, Operations research, Case studies, Experimental design, Environments, Human relations, Performance(Human), Roles(Behavior), Employee relations, Supervisors, Operational effectiveness, Organization theory.

The first part of this paper discusses some of the major theoretical issues and problems with the field of leadership. An idiographic perspective is used in suggesting ways to overcome some of the major obstacles to the better understanding and more effective application of the leadership construct. The last part of the paper describes an actual idiographic study made of leader behavior in a natural setting. A single case experimental design, which was suggested earlier as an effective way to obtain causal implications from an idiographic study (Luthans & Davis, 1981, 1982), is used to make this empirical analysis. (Author)

AD-A121 894/0/GAA PC **A06**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Design and Implementation of a Personal Database Management System.
Master's thesis,
Peter L. Jones. Jun 82, 116p

Keywords: *Computers, *Information systems, *Management techniques, Computer applications, Computer programs, Memory devices, Recall, Data storage systems, Information retrieval, User needs, Man computer interface, Input output processing, Data processing security, Programming languages, Calculators, Interfaces, Systems engineering, Performance(Engineering), Theses.

The Personal Database Management System is a hardware and software system designed to support people's memory and recall processes. It is a small, low power, and inexpensive microcomputer system which employs EEPROM and CMOS technology. The design is based upon how people manage their personal information, which was found to be different from the ways conventional computerized systems manage information.

AD-A123 159/6/GAA PC **A02**/MF **A01**
Naval Health Research Center, San Diego, CA.
Simple Kit System for Rapid Diagnosis of Cerebrospinal Meningitis in Developing Areas.
Final rept.,
Warren R. Sanborn, and Isak M. Toure. 1 Oct 82, 10p Rept no. NAVHLTHRSCHC-82-21

Keywords: *Diseases, *Health, Laboratory equipment, Agglutination, Comparison, Laboratory tests, Laboratory procedures.

Acute infectious diseases often occur in areas where conventional diagnostic laboratory services do not exist. Nevertheless, early and specific etiologic diagnosis is often the key to successful therapy and control of serious infections. A simplified laboratory kit was developed through laboratory and field studies for the rapid diagnosis of cerebrospinal meningitis. This study was designed to assess the effectiveness of this kit, employing coagglutination tests, when operated by rural medical attendants. Field studies conducted in West Africa revealed that medical attendants could, with a minimum of technical familiarization, rapidly and accurately diagnose bacterial meningitis cases. This kit, employing inert particle aggregation tests (coagglutination or latex agglutination) appears to be appropriate technology that can effectively support primary health care delivery in developing countries. (Author)

AD-A123 826/0/GAA PC **A07**/MF **A01**
Naval Postgraduate School, Monterey, CA.
West African Oil: Will It Make a Difference.
Master's thesis,
David C. Underwood. Dec 82, 145p

Keywords: *Petroleum, *Economic analysis, *West Africa, Natural gas, Oils, Petroleum industry, Hydrocarbons, Resource management, Reserves(Energy), Production, Capacity(Quantity), Crude oil, Exports, International trade, Economic impact, Petroleum geology, Developing nations, Theses.

This thesis analyzes the commercial development of West Africa's petroleum resources and examines the implications of sudden 'oil wealth' for the region's political and economic development. Section one outlines the evolution of the petroleum industry and surveys the hydrocarbon potential of twenty nations along the coast from Senegal to Angola, and inland from Mali to the Central African Republic. An evaluation of the physical and political constraints on the development of the region's petroleum resources and an aggregate analysis of the area's potential for new oil reserves and production capacity are also presented. Finally, by drawing from the experiences of established oil producers line Nigeria, the economic and political implications of the widespread development of petroleum resources in West Africa are projected at the domestic and regional levels. Specifically, will newfound oil wealth help resolve existing problems, or will it magnify them. The study concludes that for most of these countries, oil wealth will be a mixed blessing. (Author)

AD-A125 063/8/GAA PC **A03**/MF **A01**
Pandalai Coatings Co., Brackenridge, PA.
Investigative Study on Alcohol Diesel Fuel Blends.
Final rept. 1 Oct 80-30 Jun 81,
K. Pandalai, Adel Ayoub, and B.Pandalai. Jun 81, 50p Rept no. 5
Contract DAAK70-80-C-0252

Keywords: *Diesel engines, *Ethanol, *Fuels, *Alcohols, Mixtures, Storage, Stability, Compatibility, Acetates, Ethyl radicals, Surface active substances, Solvents, Separation, Feasibility studies, Test methods, Tables(Data).

The project involved characterization, storage stability and material compatibility studies of ethanol and 2 diesel fuels. Ten samples of commercially available fuels were obtained and blended with 10% ethanol which was denatured with gasolene and a solvent blend of ethyl acetate and MIBK. Anhydrous alcohol also was used to prepare a 10% blend to examine stability and material compatibility characteristics. It has been observed that the presence of small amounts of water in the alcohol causes phase separation and great care must be taken to prevent water contamination in the fuel system. It has also been found that certain surfactants and co-solvents would stabilize the fuel blends even when water is present in the blended fuels. Results of test on stability and material compatibility are presented in this report.

AD-A125 375/6/GAA PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Graduate School of Business.
Summary of Field Experiments and Technical Reports.
Final rept. 1981-1983,
Larry L. Cummings, and Randall B. Dunham. 10 Feb 83, 16p Rept no. 12-ONR
Contract N00014-79-C-0750

Keywords: *Employment, *Research and development, Experimental design, Field tests, Attitudes(Psychology), Planning, Transitions, Job satisfaction, Environments, Perception(Psychology), Response, Performance(Human), Productivity, Decision making, Motivation, Control, Organizations, Management, Reports, Organization theory.

This report contains a summary of a series of 18 job redesign field experiments conducted during the project. It explores the impact of changes in job attitudes and behaviors. This report also summarizes 11 other projects in the areas of Job Context, environmental structuring, cognitive evaluation theory, decision analysis, productivity enhancement, organizational processes, personal control at work and work unit structure.

AD-A125 549/6/GAA PC **A04**/MF **A01**
Office of Naval Research, Boston, MA.
Organizational Stress: A Literature Review 1974-1982.
Technical rept.,
James T. Lester. Jan 83, 72p

Keywords: *Employment, *Occupational safety and health, Organizations, Roles(behavior), Adjustment(Psychology), Conflict, Anxiety, Stress(Physiology), Attitudes(Psychology), Job satisfaction, Perception, Variables, Human relations, Questionnaires, Interviewing, Abstracts, Organization effectiveness.

104 article abstracts, obtained from the American Psychological Association's Psychological Abstracts Search and Retrieval Service, are listed, described briefly and discussed. The most general themes in the discussion are that (a) studies of organizational stress appear to be largely studies of frustration and goal-blocking in organizations, and (b) future research should be more systematic than heretofore.

APPROPRIATE TECHNOLOGY ABSTRACTS

AD-A125 945/6/GAA PC **A02**/MF **A01**
Pennwalt Corp., King of Prussia, PA.
Development of an Effective, Safe, Insect-Resistant Treatment for Food Packaging Materials.
Final rept.,
Lawrence W. Smith, Jr., Joseph Simkin, and Howard A. Bohm. 1983, 20p NATICK-TR-83/019
Contract DAAK60-78-C-0010

Keywords: *Packaging, *Pesticides, *Insects, *Food processing, Paper, Coatings, Bags, Formulations(Chemistry), Storage, Warehouses, Toxicity, Release, Bioassay, Military rations, Pyrethrum, Piperonyl butoxide, Permethrin, Resmethrin, Tribolium confusum, Trogoderma variable, Flour beetle, Housefly.

Repellent insecticides were encapsulated and then incorporated into paper coating formulations. Samples of paper coated with these formulations were tested for repellency against the adult stage of the flour beetle, Tribolium confusum (duVal) and the larval stage of the warehouse beetle, Trogoderma variabile (Ballion). Coating formulations containing microencapsulated natural pyrethrum synergized with piperonyl butoxide and similar formulations with microencapsulated synthetic pyrethroids such as permethrin and resmethrin, when applied to Kraft paper, showed greater persistency as a repellent against test insects, than standard, commercially treated Kraft paper containing an equivalent amount of natural synergized pyrethrum.

AD-A126 076/9/GAA PC **A07**/MF **A01**
Army Mobility Equipment Research and Development Command, Fort Belvoir, VA.
Materials Compatibility Studies with Fuel/Alcohol Mixtures.
LTechnical rept. May 79-Nov 81,
Paul Touchet, Basil Zanedis, Mari-Catherine Fischer, and Paul E. Gatza. Jul 82, 142p Rept no. MERADCOM-2366

Keywords: *Fuels, *Alcohols, Fuel additives, Additives, Feasibility studies, Elastomers, Metals, Gasoline, Test methods, Materials, Fuel alcohol mixtures, Gasohols, Material compatibility.

Representative fuel-resistant elastomers, plastics, and metals were evaluated for compatibility with commercial gasolines, diesel fuel, ASTM test fuels, and blends thereof with ethanol and methanol at several concentration levels. The test program was designed to ascertain the effects of the fuels on the materials as well as the effects, if any, of the materials on the fuels. Results were analyzed and interpreted of significant changes in the performance characteristics of the materials and the fuels which would be indicative of potential incompatibilities for use in end items of military equipment. (Author)

AD-A126 102/3/GAA PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
Electroactive Polymers as Antistatic Materials.
Interim rept.,
M. K. Bernett, H. Ravner, and D. C. Weber. 7 Feb 83, 22p NRL-MR-5016, SBI-AD-E000 532

Keywords: *Plastics, Copolymers, Doping, Lubricants, Implantation, Bearings, Infrared spectroscopy, Electron spectroscopy, Contamination, Polyacetylene, Polyparaphenylene sulfide.

Current materials used for packaging precision instrument bearings contain minor amounts of antistatic agents, shown earlier to be potential contaminants to both bearing surfaces and lubricants. This investigation reports on conductive electroactive polymers as a novel approach to eliminate completely the need for antistatic additives. Polyacetylene, specially prepared at this laboratory, polyparaphenylene sulfide and a copolymer were modified by chemical doping or implantation with appropriate ions to optimize surface conductivity and oxidation stability. Effects of extended contact with lubricated and unlubricated bearing steel surfaces were examined. Newly available antistatic or conductive materials were also investigated.

AD-A126 273/2/GAA PC **A19**/MF **A01**
Carnegie-Mellon Univ., Pittsburgh, PA. Graduate School of Industrial Administration.
Change in Organizations,
Paul S. Goodman, Lance B. Kurke, Chris Argyris, Barry M. Staw, and Clayton P. Alderfer. 1982, 430p
Contract N00014-79-C-0167

Keywords: *Management planning, Management, Planning, Transitions, Decision making, Leadership, Motivation, Roles(Behavior), Learning, Reasoning, Adaptation, Attitudes(Psychology), Race relations, Caucasians, Males, Work, Participative management, Long range(Time), Personnel management, Quality, Productivity, Research management, Organizational effectiveness, Institutionalization.

This book is a collection of essays on change. Its purpose is to sharpen our conceptualizations of change. The audience is anyone concerned with developing his or her theoretical view of change. At the conclusion there is no neatly drawn theory of change. We do not see that the current state of knowledge as represented in the literature supports such an endeavor. Nor is it clear that such a theory could be constructed in the near future. Neither is the book a comprehensive statement about change. Although this first chapter provides a brief status report on the change literature, the principal essays only sample certain domains of change. A casual reflection on change should indicate that it encompasses almost all our concepts in the organizational behavior literature. Think about leadership motivation, organizational environment, and roles. It is impossible to think about these and other concepts without inquiring about change. Our strategy is not to be comprehensive but to focus on some central concepts or processes about change that may be generalizable over different topic areas. We selected the book title because it focuses attention on change in organizations rather than solely on changing organizations. We are interested in change at the individual, group, organization, or organization-environment interface, but not in particular organizations such as schools, business, or governments.

AD-A126 411/8/GAA PC **A09**/MF **A01**
Naval Postgraduate School, Monterey, CA.
Technology Transfer: A Compilation of Varied Approaches to the Management of Innovation.
Master's thesis,
Claudia Lynn Bailey. Dec 82, 199p Rept no. NPS-54-82-011

Keywords: *Management techniques, *Technology transfer, Research management, Information transfer, Flow, Organizations, Operational effectiveness, Integrated systems, Identification, Literature surveys, Theses, Information flow, Technological innovation.

Today's managers often find themselves at a loss when trying to deal with the vast amount of technology and innovative information available to them; they do not know how to actively implement technological innovation. The manager who desires to learn about the effective management of technological innovation and change is faced with sources too numerous and diverse to be readily accessed and integrated. A single reference is needed. A review and analysis of the available transfer of technology data was conducted to identify those concepts, approaches and techniques that will be of assistance to managers who must recognize, evaluate and implement the technological advances within their organizations. This thesis provides a compilation of pertinent selected works on technology transfer and addresses the foundations of technology transfer; the elements of the Predictive Technology Transfer Model; applications of technology transfer; and the associated public policy issues. (Author)

AD-A126 913/3/GAA PC **A02**/MF **A01**
Army Tropic Test Center, APO Miami 34004.
Fungi Associated with Materials' Biodeterioration in the Humid Tropics.
Final rept.,
William A. Dement. Jan 83, 15p Rept no. USATTC-830101

Keywords: *Fungi, *Tropical regions, High humidity, Inspection, Accuracy, Test and evaluation, Test methods, SWAB sampling.

Swab sampling methods, commonly used in field microbiological inspections of equipment tested in the humid tropics, were found to provide an inaccurate indication of fungi that grow actively on a test item. (Author)

AD-A126 934/9/GAA PC **A04**/MF **A01**
Florida Univ., Gainesville.
Sleep Deprivation and Performance: The Optimum Use of Limited Sleep Periods.
Final rept. Apr 80-Mar 81,
Wilse B. Webb. Apr 83, 51p
Contract DAMD17-80-C-0058

Keywords: *Health, Psychological tests, Auditory perception, Vigilance, Addition, Memory(Psychology), Word recognition, Vision, Searching, Judgement(Psychology), Reasoning, Optimization, Time intervals, Scaling factors, Scoring, Statistical analysis.

The performance of three groups of young adult subjects has been measured across a 72 hour period. A computer programmed battery of tests was used which included test established as sensitive to sleep loss (auditory vigilance, addition and subjective scales), and a cognitive battery (memory tasks, anagrams, word detection, visual search, line judgements with various feedbacks, object usage, reasoning, digit symbols). The experimental variable was the placement of four hours of sleep opportunities. The control group had no sleep, one experimental group slept from 10-12 PM prior to 'night' two and three (preparatory sleep) and one slept from 8 to 10 AM after 'nights' two and three (recovery sleep). This report presents preliminary analysis of the date as well as data analysis completed on earlier continuous peformance measures. (Author)

AD-A126 998/4/GAA PC **A02**/MF **A01**
Pennsylvania Univ., Philadelphia. Dept. of Chemistry.
Electrochemistry of Polyacetylene: Application in High Power Density Rechargeable Batteries.
Interim technical rept.
A. G. MacDiarmid, M. Aldissi, R. B. Kaner, M. Maxfield, and R. J. Mammone. Jan 83, 6p Rept no. TR-83-2
Contracts N00014-81-K-0648, DE-AC02-81ER10832

Keywords: *Plastics, *Batteries, *Acetylene, *Electric power, High power, High density, Anions, Electric discharges, Solutions(Mixtures), Electrolytic cells, Electrolytes, Cathodes, Doping, Polyacelylene, Rechargeable batteries.

The best overall performance of rechargeable batteries using polyacetylene as both anode- and cathode-active materials are obtained from cells having a neutral (CH) cathode and n-doped anode in the charged state. It has been found that it is possible to chemically and electrochemically p-dope (CH)x to the metallic regime in aqueous solution. (Author)

AD-A127 126/1/GAA PC **A03**/MF **A01**
Leadership and Management Development Center, Maxwell AFB, AL.
Management's Role for Reducing Employee Stress.
Final rept.,
Clifford M. Purington, Jr. Mar 83, 38p Rept no. LMDC-TR-83-1

Keywords: *Management planning, *Employee participation, *Health, Human factors engineering, Jobs, Medical research, Preventive medicine, Stress management.

This literature review on job related stress is based on several sets of findings from behavioral and medical research. Support is offered for the premise that job related factors are a primary cause of stress induced illness among people in today's work force. Whether or not a job actually provokes stress depends a great deal on how a person perceives the situation. This perception in turn is influenced by a variety of individual differences in people and by differences in the work environment. Medical researchers now believe that the chemical stress reaction within the human body is the most important causative factor in contemporary health breakdowns. The economic costs of stress in terms of health care in 1980 was on in every 14 dollars. Management is now realizing the related personnel costs associated with absenteeism, turnover, premature retirement, serious illness, alcoholism, and death will become an even bigger problem in the future. Authors generally agree that the responsibility for reducing employee stress belongs to management. However, since there is no single cause or effect of stress, a simple solution to correct the problem does not exist.

Therefore, a combination of approaches need to be established to help people and organizations deal effectively with stress in the work force. The review concludes with some discussion and recommendations to management for helping employees cope productively with job related stress.

AD-A127 221/0/GAA PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Program Analysis Div.
Major Science and Technology Issues.
30 Jan 81, 59p Rept no. GAO/PAD-81-35

Keywords: *Management planning, *Technology assessment, *Research and development, United States Government, Policies, Budgets, Requirements, Scientific organizations, Education, Costs, Accountability, Public funds, Long range planning.

Developments in science and technology have an increasingly pervasive effect on the way we live. Consequently, public policy must continually address problems which have significant science and technology components. In its various functions, the Federal Government performs, funds, and regulates science and technology. These Federal Activities often require a balance among: a need for more and better science and technology, pressure for more accountability for the use of public funds, and more attention to preventing the negative consequences of science and technology. This study identifies emerging issues related to Federal involvement in science and technology and describes GAO's efforts in this area. (Author)

AD-A127 281/4/GAA PC **A04**/MF **A01**
Arizona Univ., Tucson. Dept. of Psychology.
Role of a Mental Model in Learning to Operate a Device.
Technical rept.,
David E. Kieras, and Susan Bovair. 1 Mar 83, 59p
Rept no. UARZ/DP/TR-83/ONR-13
Contract N00014-81-C-0699

Keywords: *Education, *Training, Models, Control panels, Operation, Performance(Human).

This report presents twc studies concerned with learning how to operate a simple control panel device, and how this learning is affected by understanding the internal structure of the device, which is a device model for the device. The first experiment compared two groups, one of which learned a set of operating procedures for the device by rote, and the other learned the device model before receiving the identical procedure training. The model group learned the procedures faster, and even after one week, retrained them better and executed them faster; a typical effect size is a 20% improvement. Furthermore, the model group could simplify, or make more efficient, the procedures far more often then the rote group. The second study examined the hypothesis that the improvement is due to the model group being able to infer the procedures, which would lead to more rapid learning and better recall performance. The same group manipulation was used, but subjects inferred the procedures rather than learning them, and thought out loud while doing so. The model group based their reasoning on direct inferences from the device model, and inferred the correct procedures in almost the minimum amount of time.

AD-A127 293/9/GAA PC **A06**/MF **A01**
Logistics Management Inst., Washington, DC.
Manufacturing Technology Program Information System: Functional Description.
Final rept.,
Kenneth J. Wright, and Walter P. Hamilton, III . Feb 83, 114p Rept no. LMI-RE104
Contract MDA903-81-C-0166

Keywords: *Management planning, *Information systems, *Industrial plants, Operational effectiveness, Data storage systems, Data bases, Computer programs, Department of Defense, User needs, Man computer interface, Systems engineering, Systems management, Input output processing, Cost analysis, MTP(Manufacturing Technology Program), MTPIS(Manufacturing Technology Program Information System).

This document contains a functional description of the Manufacturing Technology Program Information System (MTPIS). This MTPIS will provide OSD and Service staff members a tool to strengthen Program management's performance in planning, programming, budgeting, execution, documenting benefits and diffusing technology throughout the industrial base. The proposed MTPIS is an automated data processing system to replace most of the existing manual procedures used by OSD and Service staff members. The system will provide automated storage of and access to Program-related data. These data will reside in a central computer's data base and will be accessed by the DBMS and related applications software. (Author)

AD-A127 404/2/GAA PC **A03**/MF **A01**
California Univ., Los Angeles. School of Engineering and Applied Science.
Preparation and Properties of Halide Glasses and Glass-Polymer Composites.
Final technical rept.,
John D. Mackenzie. 1982, 35p UCLA-ENG-82-19, AFOSR-TR-83-0227
Grant AFOSR-80-0059

Keywords: *Plastics, *Glass, Preparation, Crystals, Crystallization, Viscosity, Vibrational spectra, Porous materials, Fluorides, Zirconates, Ferroelectric crystals, Test and evaluation, Research management, Applied mechanics, Halide glasses.

Research has been carried out on two families of solids. The first one involves fluoride, chloride and bromide glasses. The second one involves microporous silica glass impregnated with organic polymers as well as inorganic crystals. The viscosity, vibrational spectra, chemical durability, fiber preparation and effects on oxygen on the properties of fluorozirconates have been studied. A number of new halide glasses were discovered. Microporous silica glass impregnated with PMMA was found to be highly transparent in the visible and possesses abnormal properties. Many crystals impregnated into silica glass were found to have their melting points depressed and some crystallographic transitions were also suppressed.

AD-A127 425/7/GAA PC **A03**/MF **A01**
Naval Research Lab., Washington, DC.
Hot Corrosion in Gas Turbines.
Memorandum rept.,
R. L. Jones. 27 Apr 83, 26p Rept no. NRL-MR-5070

Keywords: *Turbines, *Corrosion, Research management, Symposia, Fossil fuels, Theory, Low temperature, Hot corrosion.

A review is presented which gives a brief, largely chronological overview of the development of the different theories of hot corrosion. This review was the Keynote Lecture for the Gas Turbine Session of the Symposium on Corrosion in Fossil Fuel Systems, Electrochemical Society Meeting, Detroit, MI, October 1982. (Author)

AD-A127 572/6/GAA PC **A03**/MF **A01**
Carnegie-Mellon Univ., Pittsburgh, PA. Dept. of Computer Science.
Case Study in Writing Efficient Programs.
Interim rept.,
Jon Louis Bentley. 25 Jan 83, 38p Rept no. CMU-CS-83-108
Contract N00014-76-C-0370

Keywords: *Computers, Microcomputers, Computer programs, Modification, Data processing, Time, Printing, TRS-80 Model 3 computers, Small businesses.

The time and space performance of a computer program rarely matter, but when they do they can be of crucial importance to the success of the overall system. This paper discusses the performance issues that arose in the implementation of a small system (twelve programs, two thousand lines of code) for a small business. The paper emphasizes a general methodology for improving system performance; the details of the case study show how the general techniques are applied in a particular context. (Author)

AD-A128 747/3/GAA PC **A04**/MF **A01**
Purdue Research Foundation, Lafayette, IN.
Poor Performers: Supervisors' and Subordinates' Responses.
Technical rept.,
Daniel R. Ilgen, Terrence R. Mitchell, and James W. Frederickson. Jun 81, 55p ARI-TR-517
Grant MDA903-78-G-0005

Prepared in cooperation with Washington Univ. Contract MDA903-79-C-0543.

Keywords: *Employment, *Management techniques, *Employee participation, Supervisors, Personnel management, Standardization, Perception(Psychology), Feedback, Group dynamics, Response, Attitudes(Psychology), Ratings, Social psychology, Variables, Data acquisition, Methodology.

This report is second in a series entitled 'The Effective Use of Feedback in Organizational Settings: A Process Centered Approach'. Forty-two three- or four-person groups with appointed supervisors worked on a clerical task for three 10-minute sessions and received feedback on their performance. Supervisors evaluated subordinate performance and provided feedback for the subordinates. Four variables were manipulated in a two-phased study. These were the supervisor's influence over subordinate pay (high power), the degree of interdependence between supervisors and their subordinates (high and low), the nature of feedback to subordinate (general, specific with a focus on quantity, and specific with a focus on quality), and the level of subordinate performance reported to the supervisor. It was found that the responses of supervisors toward subordinates were influenced by both the level of subordinate performance and by the degree of interdependence. Subordinates, on the other hand, were influenced by the leader's power as it interacted with the nature of the feedback. These influences were entirely upon attitudes and beliefs; they did not influence performance on the task after feedback. (Author)

AD-A128 772/1/GAA PC **A03**/MF **A01**
Naval Civil Engineering Lab., Port Hueneme, CA.
Sulfur Oxides Control Burner.
Final rept. Oct 79-Sep 81,
D. E. Williams. Jan 83, 28p Rept no. NCEL-TN-1654

Keywords: *Coal, *Air pollution, *Burners, *Boilers, Sulfur, Calcium oxides, Adsorbents, Fuels, Emission control, Computer programs, Equilibrium(General), Test methods, Experimental design, Flames, Tubes, Oxidation, Injection, Alternative fuels, Lime.

A new approach to burning coal in industrial-size boilers without being constrained by the sulfur content of the fuel was investigated. Coal combustion with the injection of a lime sulfur sorbent was evaluated using an equilibrium combustion computer program. Subsequent experimental work with a flame tube apparatus demonstrated that lime does react effectively with hydrogen sulfide in a low temperature, fuel-rich flame. Applications for this approach include both existing boilers designated for other fuels and new boilers designed for coal firing. (Author)

AD-A128 773/9/GAA PC **A04**/MF **A01**
Naval Civil Engineering Lab., Port Hueneme, CA.
Water-in-Oil Emulsion as a Boiler Fuel.
Final rept. Oct 81-Sep 82,
T. T. Fu. Jan 83, 56p Rept no. NCEL-TN-1653

Keywords: *Energy conservation, *Fuels, *Boilers, Combustion, Emission, Heat transfer, Energy transfer, Losses, Environmental impact, Pollution, Maintenance, Burning rate, Efficiency, Thermal expansion, Coefficients, Computations, Water-in-oil emulsion, Boiler fuels.

Extensive tests have been conducted in an in-service boiler to determine the measurable benefits of firing water in no. 6 oil emulsions. Emulsions of 3%, 6%, 9%, and 12% water concentrations have been fired during normal boiler operations. Although the emulsions could be fired satisfactorily without modifications to boiler equipment, the test results show that improvements, if any, in overall boiler efficiency or emissions were ambiguous. (Author)

AD-A128 923/0/GAA PC **A03**/MF **A01**
Colorado Univ. at Boulder. Inst. of Cognitive Science.
Four Principles for Designing Instructions.
Technical rept.,
Patricia Baggett. Apr 83, 45p Rept no. TR-121-ONR
Contract N00014-78-C-0433

Keywords: *Education, Experimental design, Classification, Media, Lectures, Motion pictures, Sequences.

This paper gives four principles for preparing multimedia instructional sequences, and, where necessary, the experimental methods for applying the principles successfully. It also describes the empirical experiments on which the principles are based. Principle One is a criterion for good terminology for unfamiliar objects, actions, and situations, with methods for deriving such terminology. Principle Two tells how to overlap visual and spoken elements in time (as in a movie of lecture with slides) in order for good associations to be formed. Principle Three states that division of instructions into conceptual units should be in agreement with people's natural conceptualization. Here, a method is presented for finding the natural conceptualization. Finally, Principle Four regards mixing audiovisual instruction with hands-on practice in learning a procedure. These principles should be useful in a variety of situations. (Author)

AD-A129 872/8/GAA PC **A03**/MF **A01**
Naval Civil Engineering Lab., Port Hueneme, CA.
Encapsulation of Friable Insulation Materials Containing Asbestos.
Final rept. Oct 81-Sep 82,
E. E. Lory, and M. J. Hienzsch. May 83, 40p Rept no. NCEL-TR-900

Keywords: *Asbestos, Hazardous materials, *Fibers, Pollution abatement, Coatings, Performance(Engineering), Safety, Naval shore facilities.

This document presents information on the encapsulation of asbestos-containing friable insulation materials (FIM). Encapsulation, which is a procedure to seal in asbestos fibers that may be subject to ready release on minimal disturbance, is a new alternative approach to the abatement of hazards from asbestos insulating materials. Encapsulation may be used in specific sites and cases instead of removal of asbestos-containing FIM. This document introduces the facilities architect or engineer to encapsulant materials, established and planned testing criteria, application techniques, the advantages and drawbacks to using encapsulants, and a guide specification for encapsulation of asbestos-containing FIM. (Author)

AD-A130 331/2/GAA MF **A01**
New Mexico Engineering Research Inst., Albuquerque.
Selective Automatic Fire Extinguisher for Class A with Notification (SAFE CAN). Volume 2. Appendices.
Final rept. 7 May 81-31 Mar 83,
Christopher W. Wilson, Thomas M. Trujillo, and
Dennis Zallen. May 83, 383p NMERI-TA3-1-VOL-2,
AFESC/ESL-TR-83-07-VOL-2
Contract F29601-81-C-0013
Availability: Microfiche copies only.

Keywords: *Fire safety, Facilities, Electronic equipment, Computers, Fire extinguishing agents, Water, Tetrafluoroethylene resins, Acoustic equipment, Receivers, Industries, Patents, Circuits, Experimental data, Test methods, Graphs, Tables(Data), Automatic.

Currently, fire protection in electronic and computer facilities is provided by full flooding Halon or water sprinkler systems. These systems are expensive and/or damaging to electronic equipment. An original, compact, portable, automatic extinguisher and alarm unit for local extinguishment, such as waste receptacles, is described. An acoustic receiver which detects the alarm and provides fire department notification is also described. Environmental, component, and system testing is discussed and test data presented. This report is divided into two volumes. Volume I consists of the text, and Volume II consists of appendices. (Author)

AD-A130 457/5/GAA PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Artificial Intelligence Lab.
Semantic Support for Work in Organizations.
Memorandum rept.,
Gerald Barber, Peter de Jong, and Carl Hewitt. Apr 83, 16p Rept no. AI-M-719
Contract N00014-80-C-0505

Keywords: *Computers, Man computer interface, Planning, Decision making, Problem solving, Management, Systems engineering, Artificial intelligence, Data processing, Data bases, Management information systems, Automation, Logistics support.

Present day computer systems cannot implement much of the work carried out in organizations such as: planning, decision making, analysis, and dealing with unanticipated situations. Such organizational activities have traditionally been considered too unstructured to be suitable for automation by computer. We are working on the development of computer technology to overcome these limitations. Our goal is the development of a computer system which is capable of the following: describing the semantics of applications as well as the structure of the organization carrying out the work, aiding workers in carrying out the applications using these descriptions, and acquiring these capabilities in the course of the daily work through a process which is analogous to apprenticeship.

AD-A130 622/4/GAA PC **A02**/MF **A01**
California Univ., Los Angeles. Graduate School of Management.
Issues in Software Maintenance.
Technical rept.,
Bennet P. Lientz. Jul 83, 24p
Contract N00014-83-K-0257

Keywords: *Maintenance, *Computers, Data processing, Programmers, Computer programming, Systems management, Management information systems, Productivity.

Up to a few years ago the area of software maintenance was largely ignored. Interest has increased in the last few years due to several factors. First, the increased volume of enhancement and maintenance with more systems from that of ten years ago has restricted resources available for new development. Second, there has been a growing awareness that tools and aids which assist development of information systems may have little effect on operational systems. Third, the management of information systems has come under increasing scrutiny. In this report we highlight some of the major issues that surfaced during several extensive operational software studies. These sources have pointed to significant questions that must be addressed concerning the roles of the users in operations and maintenance, the management of maintenance, and the types of tools and techniques that are needed in maintenance. (Author)

AD-A130 796/6/GAA PC **A20**/MF **A01**
European Office of Aerospace Research and Development, FPO New York 09510.
Information Technology and Development Series. Volume 2. Informatics and Industrial Development. Proceedings of the International Conference on Policies for Information Processing for Developing Countries Held at Dublin, Ireland on 9-13 March 1981,
F. G. Foster. Nov 82, 457p Rept no. EOARD-TR-83-11
For sales information of individual items see AD-P001 451 - AD-P001 500.

Keywords: *Computers, *Technology transfer, *Information systems, Information transfer, Computer applications, Industrial engineering, Industrial production, Foreign aid, Automation, Sociology, Economics, International relations, Policies, Strategy, Resource management, Microelectronics, Productivity, Employment, Computers, Telecommunications, Informatics, Industrial development, Third World Nations, Compilation reports.

The International Conference on Informatics and Industrial Development, held in Dublin from 9 to 13 March 1981, was the first international meeting on this subject and had the great merit of raising a series of issues concerning both the applications of informatics to industry and the development of the informatics industry itself. The need for further in-depth research was also stressed. The keynote of the debates concerned the effective transfer of technology to developing countries as an important element in the whole development process, considering all the relevant aspects and showing to the organizations involved the importance of this issue and the need to emphasized and expand their activities of assistance to developing countries. The conference dealt with subjects of great importance to developing countries and will surely constitute one of the main contributions to the preparatory work of the IBI SPIN II Conference on Strategies and Policies for Informatics.

AD-A131 040/8/GAA PC **A03**/MF **A01**
Armed Forces Food Science Establishment, Scottsdale (Australia).
Processing Cost Reduction Program Freeze Dried Foods.
Technical rept. 1974-1979,
K. D. Hoey. Mar 83, 28p Rept no. AFFSE-1/83

Keywords: *Cost benefits, *Food, *Food processing, Freeze drying, Costs, Reduction, Meals, Throughput, Production rate, Industrial plants, Low costs, Military rations, Army equipment.

The processing cost of freeze dried meals produced at AFFSE was reduced by an average of 31% over the period 1974 to 1979. The cost reduction was achieved by increasing the throughput rate of the freeze drying plant by an average of 45%. It is concluded that further cost reductions could be achieved by formulation changes and by the use of lower cost, but not lower quality, ingredients. (Author)

AD-A131 216/4/GAA PC **A02**/MF **A01**
Georgia Inst. of Tech., Atlanta. Production and Distribution Research Center.
Computer Aided Layout Programs. A Contemporary Appraisal,
Leon F. McGinnis. 1982, 22p Rept no. PDRC-82-11
Contract N00014-80-K-0709

Keywords: *Computers, *Plant layout, Facilities, Industrial engineering, Computer logic, Requirements, Scoring, Methodology, Limitations, Algorithms, Construction, Computer aided layout.

Widely available facility layout programs are discussed. The program logic, data required, scoring methods and limitations are evaluated for both construction and improvement programs. Implementation technology and other areas of improvement are discussed. (Author)

AD-A133 515/7/GAA PC **A05**/MF **A01**
Letterman Army Medical Center, San Francisco, CA.
Present Concepts in Internal Medicine, Nutritional Support Symposium. Volume 14, Number 1. Summer 1983,
David S. Keisler, Jr., Fred H. Goldner, Robert E.
Jones, David R. Haburchak, and Robert L. Myers.
1983, 89p

Keywords: *Health, *Nutrition, Hormones, Infectious diseases, Starvation, Adaptation(Physiology), Patients, Minerals, Vitamins, Trace elements.

This symposium consists of eight articles, three appendices, seven tables, and four figures. It includes articles on total parenteral nutrition; nutritional assessment; nutrient and hormonal adaptations to starvation; infectious consequences of malnutrition; minerals; vitamins and trace elements in parenteral nutrition; enteral alimentation; and writing total parenteral nutrition orders. (Author)

AD-A133 571/0/GAA PC **A03**/MF **A01**
California Univ., Berkeley. Operations Research Center.
Production Networks: A Dynamic Model of Production.
Research rept.,
Steven T. Hackman, and Ronald W. Shephard. Jun 83, 31p Rept no. ORC-83-4
Contract N00014-76-C-0134

Keywords: *Economic analysis, *Productivity, Network analysis(Management), Dynamics, Mathematical models, Allocations, Resource management, Production networks.

This paper introduces the dynamic production network as a dynamic model of production which exhibits the real complexity underlying the simple treatments commonly used in economic analyses. The model reflects the truly dynamic character of production by illustrating directly the time substitutions of both input and output and modeling the intermediate product transfers explicitly. The abstract dynamic production network correspondence which relates input to output for this model is defined. From this, the concept of the technically efficient subset is introduced for which a proof of its non-emptiness is provided. The optimization problem that is used to obtain a technically efficient point can be used fpr resource allocation; a preliminary treatment is provided. Some limitations of the present model are also discussed. (Author)

AD-A133 904/3/GAA PC **A10**/MF **A01**
Army Engineer Inst. for Water Resources, Fort Belvoir, VA.
Forecasting Municipal and Industrial Water: IWR MAIN System User's Guide for Interactive Processing and User's Manual.
Final rept..
James E. Crews, and Mary Ann Miller. Jul 83, 207p
Rept no. IWR-RR-83R-3

Keywords: *Water supply, *Urban planning, Urban areas, Industries, Utilization, Forecasting, Mathematical prediction, Mathematical models, Computerized simulation, Computer files.

This two volume report comprises the necessary information to effectively use a computerized procedure for estimating and forecasting municipal water requirements. The procedure, known as the IWR MAIN System, is a flexible and comprehensive planning tool for separately estimating residential, commercial/institutional, industrial, and public-unaccounted water sectors in a community. Within these sectors, requirements are further estimated for individual categories of water users, such as metered-sewered residencies, flat rate-sewered residences, commercial establishments, institutions, three-digit Standard Industrial Classification manufacturing categories, public usage and free service as well as unaccounted use. Estimates are made of mean annual, maximum day, and peak hour requirements. Volume I contains the users guide for interactive processing. It is the procedure by which a user creates or modifies data parameter files, modifies the library of water usage coefficients, runs the IWR MAIN Model, and selectively prints reports generated by the model. Volume II is the users manual. It documents the computer program and presents instructions for data preparation.

AD-A134 343/3/GAA PC **A07**/MF **A01**
Purdue Univ., Lafayette, IN. School of Civil Engineering.
Analytical and Experimental Investigation of Soil Reinforcing.
Final rept. 1 Jan 81-30 Jun 82 on Phase 1,
R. D. Holtz, and M. E. Harr. Oct 83, 142p AFESC/ESL-TR-82-31
Contract F08635-71-K-0036

Keywords: *Soils, *Textile industry, Roads, Walls, Structures, Interactions, Loads(Forces), Bearing strength, Test methods, Mathematical prediction, Reinforced earth structures, Geotextiles.

Significant improvements in the capacity and service life of reinforced earth structures require an improved understanding of the fundamental behavior of these systems. Both experimental and analytical investigations were carried out to develop models for the interaction of geotextile-type reinforcement and granular soils. Reinforcement configurations and systems investigated were thought to be applicable to alternate launch and recovery surfaces (ALRS). Model ALRS systems using geotextiles and geogrids as reinforcement were tested in the laboratory in a variety of configurations. These were loaded to failure, quasi-statically, by both plane strain and axisymmetric rigid plates. Load-deformation characteristics as well as the shape of the deflected basin are reported. Significant increases in bearing capacity and modulus of subgrade reaction as a function of depth and number of layers of reinforcement were observed. However, there was a decrease in improvement as the depth to the first layer increased. Edge fixity conditions were found to be relatively unimportant, and the benefit of multiple-reinforcement layers was greater if the depth and spacing were small compared to the diameter of the loaded area. Surprisingly, little difference was observed in the response of the geogrids and geotextiles, probably because sand was used in the experiments. Geometric scaling of bearing capacity, based on the diameters of the loaded areas, was not possible.

AD-A134 864/8/GAA PC **A03**/MF **A01**
Carnegie-Mellon Univ., Pittsburgh, PA. Robotics Inst.
Precision Flexible Machining Cells within a Manufacturing System.
Interim rept.,
M. R. Cutkosky, P. S. Fussell, and R. Milligan, Jr.
Mar 83, 48p Rept no. CMU-RI-TR-83-2

Keywords: *Industrial plants, Cells, *Machine tools, Industrial equipment, Industrial production, Computer aided instruction, Manufacturing cells.

This report discusses the conceptual design of a manufacturing cell for a small-batch manufacturer. The cell produces precision parts with a minimum of machining equipment. The cell design emphasizes near-term technology and uses off the shelf items where possible. The proposed cell can run unattended for a moderate period of time (eg. over-night). The design philosophy is to treat the cell components and control programs as discrete modules in a hierarchy. The resulting cell is easily integrated into a larger system. It is also readily modified or expanded as more sophisticated equipment and techniques becomes available.

AD-A134 902/6/GAA PC **A02**/MF **A01**
Tufts-New England Medical Center, Boston, MA.
Role of Intestinal Bacteria in Acute Diarrheal Disease.
Final rept. Jul 75-Dec 81, Annual rept. Sep 80-Dec 81,
S. L. Gorbach. Jul 82, 25p
Contract DAMD17-76-C-6007

Keywords: *Diarrhea, *Diseases, Isolation, Serology, Antigens, Genetics, Plasmids.

Our studies provide evidence for at least 3 serologically distinct groups of surface antigens present on ETEC isolated from man. E. coli strains in each of the 3 serologic groups produce surface pili of identical size, mophology, and molecular weights. Antisera against these three pili types were used to test 106 strains of enterotoxigenic E. coli. isolated from humans, as well as non-toxigenic strains, normal fecal isolates of E. coli, and enterotoxigenic E. Coli strains isolated from animals.

AD-A135 326/7/GAA PC **A02**/MF **A01**
Institute for Medical Research, San Jose, CA.
Immunomodulation with Synthetic Molecules: Mechanisms of Actions and Effects on Macrophages.
Annual rept. no. 1, 1 Nov 82-31 Oct 83,
D. A. Stevens, and E. Brummer. 1 Nov 83, 17p
Contract N00014-83-K-0018

Keywords: *Health, *Drugs, Polymorphonuclear leukocytes, Interactions, Response(Biology), Molecules, Fungi, Spleen, Lymph nodes, Mice, Muramyl dipeptide, Mitogens.

Immunoenhancing drugs were studied both for their general effects on host immunity and their effects on immune interactions with microbial infections. These studies focused preferentially on defined single molecules with immunomodulating properties, and on fungi as the microbes of interest. The prototype immunomodulator studied was muramly dipeptide (MDP). We showed that MDP in vivo enhanced cellurity and mitogen responses in some lymphoid compartments (lymph nodes) and depressed responses in other (spleen). The optimum dose and interval for effect were defined, and subpopulations of the compartments were fractionated which were responsible for differences observed with different mitogens (including suppressor cells). We also showed that polymorphonuclear leukocytes (PMN) can be activated as a byproduct of an immunological reaction, and in that state have enhanced fungicidal activity and can kill some fungi which normal PMN cannot. Activation could be reproduced with lymphokines. We showed that CP46665, a lipoidal amine, in vivo enhances fungicidal activity of PMN and alveolar macrophages (AM), but had no in vitro effect. However, interferon, produced by gene cloning recombinant DNA techniques, had an adverse effect on PMN or AM antifungal activity.

AD-A135 430/7/GAA PC **A03**/MF **A01**
University of South Alabama, Mobile. Coll. of Medicine.
Biochemical Basis of Virulence in Epidemic Typhus.
Annual rept. Aug 80-Apr 81, Final rept. 1 Feb 79-30 Apr 81,
H. H. Winkler. Jan 83, 32p
Contract DAMD17-79-C-9018

Keywords: *Diseases, Virulence, Biochemistry, Epidemiology, Strains(Biology), Fatty acids, Interactions, Polymorphonuclear leukocytes, In vitro analysis, Plasmids.

The purpose of the project is to elucidate the biochemical basis of virulence in epidemic typhus. The basic method is a comparison of the E strain and Breninl strain (avirulent and virulent, respectively) of Rickettsia prowazekii in their interaction with the host defense system. Subsequent to the last annual report, work has focused on two areas (1) a study of the ability of virulent and avirulent Rickettsia prowazekii in the cytoplasm of macrophage-like cell lines which employed a fusion technology and (2) the preparation of a manuscript on the macrophage-like cell lines' ability to differentiate the virulent and avirulent typhus rickettsiae.

AD-A135 457/0/GAA PC **A05**/MF **A01**
Air Force Inst. of Tech., Wright-Patterson AFB, OH.
Perceptions of Quality of Nursing Care: Patients and Registered Nurses in a Hospital Using 12-Hour Shifts.
Master's thesis,
L. A. Van Vechten. 1983, 98p Rept no. AFIT/CI/NR-83-64T

Keywords: *Health, *Health manpower, Quality, Perception(Psychology), Patients, Data acquisition, Scaling factors, Sampling, Theses.

The purpose of the study was to investigate the quality of nursing care as perceived by patients and as perceived by registered nurses who worked a compressed workweek. There were 33 patients and 35 registered nurses in the sample. The study was conducted in a 100-bed, private, investor-owned hospital in the southeast United States within an urban setting. Data were collected using a modified version of Risser's Patient Satisfaction Scale and two researchers-devised questions. A mean rating and a t test for independent samples were used for analysis of data. Significance was set at the 0.05 level. Three hypotheses were established: H1: Patients will perceive the care received from registered nurses who work a compressed workweek as quality nursing care. H2: Registered nurses who work a compressed workweek will perceive care administered to patients as quality nursing care. H3: There will be no difference between the perception of registered nurses and the perception of patients as to the quality of nursing care. All three hypotheses were supported.

AD-A135 501/5/GAA PC **A04**/MF **A01**
Naval Health Research Center, San Diego, CA.
Techniques of Psychosocial Epidemiology.
Final rept.,
L. A. Palinkas. Oct 83, 63p Rept no. NAVHLTHRSCHC-83-22

Keywords: *Diseases, Communicable diseases, Sociology, Psychology, Social psychology, Correlation techniques, Rates, Variables, Scaling factors, Mortality rates, Morbidity.

Psychosocial epidemiology is distinguished from other forms of epidemiologic research by its emphasis on the role of stress in the distribution of disease and its use of psychometric scales. This report provides a summary of the quantitative techniques employed in psychosocial studies in an attempt to provide a better conception of this subfield of epidemiology. The summary contains a review of research design, data collection, and data analysis. Prospective, retrospective and cross-sectional designs are examined and the advantages and disadvantages of each design evaluated. The data for psychosocial studies are usually represented in the form of rates and scales. The major dependent variables are typically disease and stress events while independent variables include sociodemographic characteristics, life events, social support indices, and personality measures. Methods of data analysis discussed include relative risk, chi-square tests, correlation coefficients, lifetime risk and attributable risk. Methods of association used specifically in prospective studies include life tables, survival analysis, and Fourier analysis. Multivariate analyses are used to adjust and control for potential confounding variables and test hypotheses. The last section of the report briefly examines the necessity of a qualitative perspective in each of the stages of a psychosocial study.

AD-A136 124/5/GAA PC **A16**/MF **A01**
Colorado Univ. at Boulder. Dept. of Civil, Environmental, and Architectural Engineering.
Strength and Behavior of Steel Fiber-Reinforced Concrete under Combined Tension-Compression Loading.
Interim rept.,
R. W. Meier, H. Y. Ko, S. Sture, and C. C. Feng. May 83, 358p AFOSR-TR-83-0974
Grant AFOSR-81-0072

Keywords: *Reinforced concrete, *Steel industry, Steel, Behavior, Loads(Forces), Tensile stress, Tensile strength, Stress strain relations, Failure(Mechanics), Deformation, SFRC(Steel Fiber Reinforced Concrete), Biaxial tension compression, Biaxial compression.

The addition of steel fibers to concrete-type materials has been shown to improve many of the engineering properties of those materials. Notable among them is an enhancement in the tensile strength of an otherwise weak and brittle material. Although much is known about the tensile strength of steel-fiber reinforced concrete (SFRC) under one-dimensional state of stress, little is known with regard to the strength behavior under multi-dimensional tension-compression loading. This is attributed to a lack of suitable equipment for simultaneously applying tensile and compressive stresses. The research program described herein is focused on developing such equipment to study the behavior of SFRC under combined loadings. A review of the state-of-the-art research on the tensile strength of SFRC is given and a review of various methods of applying tensile stresses to concrete specimens is presented. The problem is to be overcome in applying a pure principal tensile stress are discussed.

AD-A136 145/0/GAA PC **A04**/MF **A01**
Forest Products Lab., Madison, WI.
Solar Kilns: Feasibility of Utilizing Solar Energy for Drying Lumber in Developing Countries,
J. L. Tschernitz, and W. T. Simpson. Jan 77, 69p
Rept no. FPL-AID-PASA-TA(AG)-02-75

Keywords: *Wood, *Drying, *Solar energy, *Solar drying, Developing nations, Industrial production, Wood, Drying apparatus, Solar heating, Greenhouse effect, Feasibility studies.

A substantial portion of wood exported from developing countries is in the form of logs. To aid their economic growth, these countries are emphasizing increased domestic processing of logs into lumber or finished products. Improper, ore lack of, lumber drying has deterred this value added manufacturing. Solar kilns can offer low-cost drying capacity. This study tested the feasibility of using solar energy to improve lumber drying by small- to medium-scale operators in developing countries. A literature review confirms the potential of solar drying and points out the success or failure of some design features, construction details, and applications of solar dryers. Feasibility estimates concluded that solar drying is practicable if a dryer meets production and cost requirements. Two dryer designs, a greenhouse type and an external-collector type, were proposed. Their production capacity was estimated by a material and energy balance analysis, and their construction costs were estimated.

AD-A136 586/5/GAA PC **A03**/MF **A01**
Trinity Coll., Dublin (Ireland). Dept. of Psychology.
Effects of Prolonged Driving on Time Headway Adopted by HGV (Heavy Goods Vehicle) Drivers.
Final technical rept.,
R. G. C. Fuller. Sep 83, 31p ARI-RN-83-33
Grant DAERO-78-G-006

Keywords: *Transportation, *Roads, *Safety, Trucks, Operation, Long range(Time), Fatigue(Physiology), Risk, Behavior, Endocrine glands, Selection, Training, Road tests, Ratings, Aging(Physiology), Scheduling, Manhours, Adaptation, Adjustment(Psychology), Motor vehicle accidents, Convoys, Driving.

Truck driver safety was studied under conditions of prolonged normal driving, prolonged continuous convoy driving, and continuous convoy driving under conditions of task uncertainty. In all experiments drivers were required to drive an experimental truck for 4 consecutive days. Dependent variables were driver performance, self-ratings, and endocrine changes. Apart from changes over time, when possible the effects of age and time of work period onset were determined. Symptoms of fatigue were most typical of the end of the driving shift, becoming evident from about the 9th hour of driving, and were particularly characteristics of older drivers on a shift finishing at 02.30 hours. Nevertheless, the requirement to drive 11 hours per day for 4 consecutive days did not lead to conspicuous deterioration in driving performance under normal driving conditions. Even prolonged continuous convoy driving did not produce impairment but elicited compensatory adjustments toward the end of the late shift. Finally, task uncertainty was not found to induce earlier fatigue. Drivers appeared to adjust to this condition by covertly anticipating a demand in excess of actual requirement.

AD-A136 696/2/GAA PC **A10**/MF **A01**
Naval Justice School, Newport, RI.
Not in My Navy: A Legal Guide to Drug Abuse.
Dec 83, 217p
Supersedes AD-A114 885 and AD-A126 255.

Keywords: *Drugs, Policies, Regulations, Chemical analysis, Military law, Searching, Navy, Naval personnel, Marine Corps personnel, Urine, Test methods, Urinalysis.

Contents: Policy and References, Command Options, Common Drugs and Their Effects, The Drug Abuser, Drug Chemistry, The Military Law of Drugs, Jurisdiction, Pleading (Drafting Charges in Drug Cases), Urinalysis Programs, Search and Seizure Considerations, Self-Referral and Drug Exemption Programs, and Administrative Separations.

AD-A136 755/6/GAA PC **A04**/MF **A01**
Tufts-New England Medical Center, Boston, MA.
Role of Intestinal Bacteria in Acute Diarrheal Diseases.
Annual rept. Sep 79-Aug 80,
S. L. Gorbach. Jan 81, 56p
Contract DAMD17-76-C-6007

Keywords: *Diseases, *Diarrhea, Strains(Biology), Serology, Humans, Isolation, Morphology(Biology).

Our studies provided evidence for at least three serologically distinct groups of surface antigens present on ETEC isolated from man. E. coli strains in each of the three serologic groups produce surface pili of 'identical' size, morphology, and molecular weight. The presence of these pili shows no apparent correlation with the ability to cause MR-HA of a particular rbc type(s). In the year 1979, our ETEC culture collection doubled in size; E. coli strains belonging to various O-groups have been found to react with our three serologic types of pili-specific antisera.

AD-A136 880/2/GAA PC **A05**/MF **A01**
Naval Ocean Systems Center, San Diego, CA.
Portable Life Support Stretcher Unit (PLSSU): Engineering Drawings.
Technical document,
R. W. Kataoka. Jun 83, 89p Rept no. NOSC/TD-604

Keywords: *Health, Portable equipment, Life support systems, Military applications, Patients, Monitoring.

The Portable Life Support Stretcher Unit (PLSSU) is being developed to provide a patient litter with all necessary features. The PLSSU is similar in configuration to a standard canvas litter. This allows it to interface with all military aircraft and vehicles designed to carry casualties on canvas litters. Standard military aircraft litter rack equipment, hoists, and securing equipment designed for the canvas litter can be used without modification. An important feature of the PLSSU is that it quickly transforms a utility helicopter or other transport vehicle into an equipped MEDEVAC unit, and just as quickly returns it to utility status. During a MEDEVAC operation, the patient is carried on a canvas litter, backboard, or Stokes litter, all of which can be attached to the PLSSU.

AD-A137 482/6/GAA PC **A03**/MF **A01**
Army Medical Research Inst. of Infectious Diseases, Fort Detrick, MD.
Metabolic Effects of Infection,
W. R. Beisel. 1 Sep 84, 34p

Keywords: *Diseases, Biochemistry, Hormones, Response(Biology), Nitrogen, Amino acids, Muscles, Proteins, Biosynthesis, Vitamins, Minerals.

The metabolic effects of infection influence a wide variety and number of host biochemical pathways and molecular mechanisms. These responses function in support of the many diverse defense systems used by the body to control or eliminate invading microorganisms. Despite their complexity and diversity, these responses develop in relatively consistent, almost stereotypic pattern of progression during the course of generalized febrile infections caused by many kinds of different agents. If an infection localizes within an organ system, derangements of function of that organ may be superimposed upon the generalized responses. These general metabolic responses are initiated and modulated by the release of endogenous mediators, hormones, and by central nervous system stimuli as well. The magnitude of these metabolic changes can be influenced by the severity and duration of the illness. Clinically, the most visible metabolic effects of an infectious disease are catabolic. They can be documented by measurable losses of body constituents and nutrients. However, it must be kept in mind that equally important anabolic processess are taking place at the same time. It is these latter anabolic events that are of importance in host defensive mechanisms.

AD-A137 664/9/GAA PC **A04**/MF **A01**
Johns Hopkins Univ., Laurel, MD. Applied Physics Lab.
Study of Low Level Laser Retinal Damage.
Annual progress rept. 1 Feb 83-31 Jan 84,
B. F. Hochheimer. 1 Feb 84, 55p
Contract N00024-83-C-5301

Keywords: Laser radiobiology, *Health, Retina, Laser beams, Low level, Irradiation, Reflection, Measurement, Argon lasers, Fluorescence, Decay, Rates, Water, Blood, Light scattering, Estimates, Reflectivity, Equations, Radiation injuries, Fluorescein dye.

The general objective of this program is to document changes in the retina due to very low laser irradiation. We have two primary aims. One is to develop and improve methods that can be used, in vivo, to objectively determine changes that occur in the retina from laser irradiation. The second is to determine the mechanisms that cause these retinal changes. During this past year we have: (1) Measured the change in retinal reflectivity during YAG and Argon Ion laser burn periods. (2) Determined the fluorescence decay time of fluorescein dye in water, blood and monkey retinas. (3) Obtained estimates of the amount of scattered light in the eye in the green and red spectral regions.

AD-A138 679/6/GAA PC **A03**/MF **A01**
South Carolina Univ., Columbia. School of Medicine.
Effect of Chemotherapeutic Agents on Immune Reactions.
Annual rept. Sep 81-Aug 82,
A. Ghaffar. Aug 82, 33p
Contract DAMD17-79-C-9025

Keywords: *Health, Physiological effects, Spleen, Liver, Reduction, Lymphocytes, Dosage, Toxicity, Sizes(Dimensions).

Immunotoxic effects of WR 99,210, WR 122,455 and WR-228,258 were tested in the animal model for the screening. WR 99,210 caused a significant enhancement in the phagocytic function (alpha value), and severe depression in the antibody PFC response when given before antigen, and reduction in the liver and spleen sizes. WR 122,455 and WR 228,258 had similar effects, although with somewhat less severity. Thus, the reduction in the PFC responses and reduction in splenic and hepatic sizes was less pronounced. WR 122,455 was relatively more effective in stimulating the phagocytic function whereas WR 228,258 caused no significant alteration in the phagocytic function. None of the agents seemed to alter significantly the delayed hypersensitivity reaction. In addition, T and B lymphocyte contents in the peripheral blood of human volunteers treated with WR 171,669 (single dose of 750 to 2000 mg) were enumerated. These studies evaluated 24 individuals before and 2 days after the treatment: half of these volunteers received various doses of the drug and the other half received a placebo. No significant differences were noticed in the proportions of T and B cells in the peripheral blood of these volunteers when placebo and drug-treated groups on Day 0 and Day 2 (pre- and post-treatment) samples were compared.

AD-A138 906/3/GAA PC **A05**/MF **A01**
Army Natick Research and Development Labs., MA.
Roasted and Ground Coffee: A Study of Extenders, Substitutes and Alternative Coffee Sources.
Final technical rept. Jul 80-Mar 83,
R. A. Kluter. Feb 84, 83p Rept no. NATICK/TR-84/014

Keywords: *Beverages, Substitutes, Cost analysis, Consumption, Blending, Beans, Data acquisition, Taste, Group dynamics, Sources, Military personnel, Test and evaluation, Ratings.

The purpose of this study was to: evaluate commercially available coffee extenders and substitutes; establish a data base on the effectiveness of extenders and substitutes in event of future increases in coffee bean prices; and design a consumer rating form to acquire sensory information. The following areas were investigated: reducing the amount of roasted and ground (R&G) coffee in armed Forces Recipe Service (AFRS) guidelines; replacing up to half the R&D coffee with carmel-based extenders; one-to-one substitution of roast grains for R&G coffee; three miscellaneous products; substitutions and reblending with African robusta coffee varieties. Field data confirmed laboratory findings. Recommendations on advantages and drawbacks to future deployment of extenders, substitutes and alternate varieties are provided.

AD-A138 994/9/GAA PC **A08**/MF **A01**
Harvard Medical School, Boston, MA. Dept. of Surgery.
Program for Clinical Care in Physical Trauma.
Final rept.,
F. D. Moore. 1 Mar 81, 171p
Contract DADA17-73-C-3022

Keywords: *Health, Therapy, Clinical medicine, Metabolism, Biochemistry, Substrates, Interactions, Anatomical models, Humans, Isotopes, Nitrogen, Hydrogen, Lung.

This final report covers studies in surgical metabolism, the biochemistry of convalescence from severe injury, the case of the injured, the care of the wounded, and covers both practical, clinical and theoretical research aspects. Most of the work has been carried out as clinical investigation (i.e. studies in man). A few ancillary studies in animals have been used to illuminate special problems. Studies include the following: (1) Substrate utilization, substrate interaction and the endocrine effects observed in intravenous feeding after injury; (2) The use of isotopes of nitrogen and hydrogen in substrate research in man; (3) The pathophysiology of burns with particular respect to lung injury; computer modelling in burns; acute hemorrhage in normal man as an acute trauma model; (4) Synthesis of knowledge in this field for undergraduate and postgraduate teaching of surgical care.

AD-A139 088/9/GAA PC **A02**/MF **A01**
Arizona State Univ., Tempe. Center for Environmental Studies.
Revegetation Methods for Arid Areas. Revised,
C. Willis, and D. Patten. 18 Aug 83, 12p
Contract DACW09-80-M-1205

Keywords: *Plants(Botany), Arizona, *Arid land, Horticulture, Vegetation.

In many areas in the Southwest deserts conditions favoring reestablishment of vegetation may only occur every four to seven years (Hassell 1977, Cook et al. 1974). For this reason, successful revegetation of disturbed desert lands requires special methods to prolong or take advantage of favorable moisture periods. In addition to moisture stress, soil fertility and toxicity problems are also common on areas in need of revegetation, Several agencies deal successfully with these problems. Most notable in terms of large scale revegetation efforts, are the highway departments and mining companies. Smaller organizations specialize in various aspects of revegetation such as transplanting techniques or seeding operations. This paper reviews reclamation practices currently used by the Arizona Department of Transportation, and methods recommended for revegetation of surface mining operations. In addition, transplanting techniques used by the Desert Botantical Garden in Phoenix, Arizona are briefly discussed.

AD-A142 096/7/GAA PC **A06**/MF **A01**
Construction Engineering Research Lab. (Army), Champaign, IL.
Appropriate Technology for Treating Wastewater at Remote Sites on Army Installations: Preliminary Findings.
Final rept.,
E. D. Smith, C. P. C. Poon, S. R. Struss, J. T. Bandy, and R. J. Scholze. Apr 84, 114p Rept no. CERL-TR-N-160

Keywords: *Waste management, *Sewage treatment, *Waste disposal, Wastes(Sanitary engineering), Army facilities, *Waste water, Ventilation, Cost effectiveness, Pollution, Odors, Disease vectors, Septic tanks, Installation, Chemicals, Maintenance, Site selection, Remote areas, Composting toilets, Vault toilet aeration.

At U.S. Army installations, water lines and sewage facilities are provided only in the cantonment areas, where there are enough people and activities to justify sewage collection and treatment. At remote sites--e.g., guard stations, firing ranges, and training areas--four conventional methods have been used to treat human wastes: trenching and cat holing, pit latrines, vault toilets, and chemical toilets. With these approaches, however, there have been problems with odors, pollution, and operation and maintenance. This report provides information about the selection, installation, operation and maintenance, and costs of two alternative systems--composting toilets and vault latrine aeration. These systems have been used by the private sector and other state and federal government agencies. This report details early observation of system performance. (Author)

AD-P001 451/4/GAA PC **A02**/MF **A01**
General Organization for Industrialization, Cairo (Egypt).
Overview of Informatics and Its Impact on Development,
Ibrahim M. Sharkas, Sayed Abdel Kader, and Salah El-Din Aidarous. Nov 82, 8p
This article is from 'Information Technology and Development Series. Volume 2. Informatics and Industrial Development. Proceedings of the International Conference on Policies for Information Processing for Developing Countries Held at Dublin, Ireland on 9-13 March 1981,' AD-A130 796, p19-26. Prepared in cooperation with Ain Shams Univ., Cairo (Egypt).

Keywords: *Information systems, *Technology transfer, Information transfer, Computer applications, *Computers, Telecommunications, Developing nations, Economic impact, Research management, Systems engineering, Production, Automation, Sociology, Economics, Political science, Utilization, Symposia, Informatics, Industrial development, Third World Nations, Component reports.

Awareness of the value of information leads to the uncovering of specific properties and characteristics of information, to the preception of information as a physical entity, to its definition as a natural resource and as a form of energy available to mankind waiting to be exploited. Informatics is the discipline that studies the information phenomenon, the systems of information and the processing, transfer and utilization of information, mainly, but not necessarily, with computers and telecommunications systems as the tools, for the benefit of mankind. Informatics is nothing but a tool, and its basic scope is to help countries to better solve the fundamental problems they are facing now; such as how to conduct the national economy, the optimization of the use of resources for the promotion of social and economic development-all addressed to the welfare of mankind. It is absolutely necessary and urgent for developing countries to acquire the capability of handling and processing information for their own purposes, in the same manner as the more advanced countries. In this way the interface at political level between countries may be more balanced and equitable.

AD-P001 452/2/GAA PC **A02**/MF **A01**
Tata Inst. of Fundamental Research, Bombay (India).
Socio-Economic Significance of Information Technology for Developing Countries,
R. Narasimhan. Nov 82, 12p
This article is from 'Information Technology and Development Series. Volume 2. Informatics and Industrial Development. Proceedings of the International Conference on Policies for Information Processing for Developing Countries Held at Dublin, Ireland on 9-13 March 1981,' AD-A130 796, p27-38.

Keywords: *Information systems, *Technology transfer, Information transfer, Industrial engineering, Industrial production, Sociology, Economics, Computer applications, *Computers, Telecommunications, Automation, Transformations, User needs, Utilization, Symposia, Informatics, *Industrial development, Third World Nations, Component reports.

The service sector constitutes the critical backbone of a developing society. Information technology is the technology that underpins activities in the service sector. The development and the appropriate deployment of information technology is, thus, essential to extend the scope and improve the standards of functionally available services in a society. In this sense, information technology is an appropriate technology for socio-economic development in the third world countries.

AD-P001 453/0/GAA PC **A02**/MF **A01**
Institute of Electronics Technology (Republic of Korea).
Technology Perspective of Microelectronics in the Coming Decade and Its Implications for Developing Countries,
Sang Joon Hahn. Nov 82, 8p
This article is from 'Information Technology and Development Series. Volume 2. Informatics and Industrial Development. Proceedings of the International Conference on Policies for Information Processing for Developing Countries Held at Dublin, Ireland on 9-13 March 1981,' AD-A130 796, p39-46.

Keywords: *Information systems, *Technology transfer, Information transfer, *Computers, *Telecommunications, *Electronics, Miniaturization, Circuits, Analog to digital converters, Detectors, Memory devices, Communication and radio systems, Education, Energy, Microprocessors, Computer applications, Agriculture, Food processing, Industrial production, Automation, Symposia, Informatics, *Industrial development, Third World Nations, Component reports.

In developing the potential for microelectronics applications in developing countries, it is important to consider the past performance of the national economy, its current strengths and weaknesses, and the goals and targets set forth by the planners for the future. And also the ability to regulate the inflow of microelectronics technology depends upon the level of development of the country concerned and local technological capacities in developing countries. Many of the policies towards microelectronics technology inflow must be pursued at considerable efforts for international action in order to exchange information and strengthen each developing countries' knowledge of alternatives and practices. Microelectronics technology has been developed in the developed countries while most of the current R & D activity in developing countries is not directed to the development of microelectronics technology. International assistance may be needed to help provide resources of both finance and manpower to create institutions to promote the inflow and application of this technology.

AD-P001 456/9/GAA PC **A02**/MF **A01**
National Computing Centre Ltd., Manchester (England).
EDP (Electronic Data Processing) Training - A Developing Need,
B. N. Platts. Nov 82, 7p
This article is from 'Information Technology and Development Series. Volume 2. Informatics and Industrial Development. Proceedings of the International Conference on Policies for Information Processing for Developing Countries Held at Dublin, Ireland on 9-13 March 1981,' AD-A130 796, p73-79.

Keywords: *Training, *Information systems, *Technology transfer, Information transfer, Transfer of training, *Computers, Man computer interface, International relations, Instructional materials, Computer personnel, Skills, Symposia, EDP(Electronic Data Processing), Informatics, Industrial development, Third World Nations, Component reports.

The United Kingdom National Computer Centre (NCC) Is Not Unique in offering training materials to developing nations, but it is one of the few large, hardware-independent, training authorities and it is well placed to develop and conduct long-term, co-ordinated training strategies. Commentators agree that local skills training is the key to success. Unless it is provided there will be a severe, perhaps tragic, waste of resources which must inevitably lead to a slowing of development. However, in the end it is up to the nation concerned, to face the challenge of providing sufficient well-trained personnel for its computer industry, and to take advantage of the help which is available. Here is a field where the record of the 'developed' economics is not too impressive. Developing nations should act now to avoid repeating mistakes.

AD-P001 460/5/GAA PC **A02**/MF **A01**
IBM World Trade Asia Corp. (Hong Kong).
Transferring Informatics Technology to Developing Countries: Report of Some Findings,
R. C. Barquin. Nov 82, 10p
This article is from 'Information Technology and Development Series. Volume 2. Informatics and Industrial Development. Proceedings of the International Conference on Policies for Information Processing for Developing Countries Held at Dublin, Ireland on 9-13 March 1981,' AD-A130 796, p84-93.

Keywords: *Information systems, *Technology transfer, *Computers, Information transfer, Industries, Systems engineering, Data management, Networks, Decision making, Universities, Political science, Sociology, Economic impact, Symposia, Informatics, Industrial development, Third World Nations, Component reports.

This paper presents the results of research done on the transfer of computer technology to developing countries. The field work was done in Latin America in the early to middle part of the 1970s. By studying in detail the computer industry in Latin America and the process by which the technology is transferred, we can draw several conclusions about the process of technology transfer in general and about the transfer of systems technologies in particular. It was found that there are strong arguments for approaching the transfer of systems technologies to developing countries in a different manner from the transfer of other technologies. The role of technological gatekeepers was found to be crucial roles to play in the transfer of computer technology, but their orientation toward scientific computing detracted from their mission. Of the mechanisms for the transfer of computer technology, only education was found to be permanent and continuous.

AD-P001 467/0/GAA PC **A02**/MF **A01**
Magyar Tudomanyos Akademia, Budapest.
Some Measures for Promoting Indigenous Informatics Technology,
Robert E. Kalman. Nov 82, 8p
This article is from 'Information Technology and Development Series. Volume 2. Informatics and Industrial Development. Proceedings of the International Conference on Policies for Information Processing for Developing Countries Held at Dublin, Ireland on 9-13 March 1981,' AD-A130 796, p137-144

Keywords: *Information systems, *Technology transfer, *Industrial development, *Computers, Information transfer, Data processing, Computer programs, Telecommunications, Mass media, Industrial production, Integrated circuits, Data processing equipment, Costs, Computer personnel, Training, Skills, Performance(Human), Symposia, Informatics, Industrial development, Component reports.

Information is often considered as the third basic resource, in addition to matter and energy. Although data processing is just a segment of the whole information-related technology, its impact is growing both in industrialized and developing countries. In countries which manufacture and export hardware and software products, data processing contributes directly to the nations' GNP, in other countries it can indirectly support agricultural and industrial production. It is in the interest of all governments to understand what informatics technology, in general, and data processing in particular, can do for the country and to make well-conceived measures to promote its appropriate national development.

AD-P001 472/0/GAA PC **A02**/MF **A01**
Trinity Coll., Dublin (Ireland).
Advanced Technical Training in Developing Countries - Some Wider Considerations,
K. T. Ryan. Nov 82, 8p
This article is from 'Information Technology and Development Series. Volume 2. Informatics and Industrial Development. Proceedings of the International Conference on Policies for Information Processing for Developing Countries Held at Dublin, Ireland on 9-13 March 1981,' AD-A130 796, p174-181.

Keywords: *Training, *Information systems, *Computers, *Technical assistance, Man computer interface, User needs, Policies, Planning, Economics, Strategy, Management, Africa, Symposia, Informatics, Industrial development, Third World Nations, Zambia, Component reports.

Training local employees to replace expatriates is an essential part of economic development. Quite apart from political, social or ideological goals it can be justified in cost/benefit terms. However this activity is qualitatively different from the normal DP training function and it is accelerated. It may cause some disruption and resentment. Management's clear perception of these differences and difficulties can ensure the setting of realistic training goals. Outside help, especially consultants, may be sought in choosing a strategy towards these goals. Firm commitment by the indigenous management can then guarantee their achievement.

AD-P001 475/3/GAA PC **A02**/MF **A01**
Centre for Education in International Management, Geneva (Switzerland).
Comparative Advantages in Microelectronics,
Juan F. Rada. Nov 82, 23p
This article is from 'Information Technology and Development Series. Volume 2. Informatics and Industrial Development. Proceedings of the International Conference on Policies for Information Processing for Developing Countries Held at Dublin, Ireland on 9-13 March 1981,' AD-A130 796, p199-221.

Keywords: *Industrial development, *Electronics, *Information systems, *Economic analysis, Economics, Industrial engineering, Industrial production, Technology transfer, Information transfer, Microprocessors, Microcomputers, Computer applications, User needs, Research management, Costs, Investments, Offshore structures, Labor, Developing nations, Employment, Symposia, Informatics, Industrial development, Component reports.

The initial point of departure for analyzing comparative advantages in microelectronics is to make certain explicit assumptions. First, technology changes conditions but does not determine comparative advantages. Secondly, the entire industrial infrastructure is becoming increasingly abstract, based upon technologies and guided by science. Thirdly, the all-pervasive characteristics of information technology will affect to different degrees of industries and productive activities. This comprehensive technology simultaneously affects: Production - Products and Processes, Structured and unstructured office work, services and information flows. Finally, production (in the general sense of transformation of nature and not only manufacturing) is becoming more and more a product of capital rather than labor. Current technological changes and the advent of a comprehensive information technology call for re-conceptualisation of development strategies beyond mere implementation of informatic policies. This re-conceptualization should consider that informatics will profoundly affect the productive infrastructure and the international division of labour.

AD-P001 480/3/GAA PC **A02**/MF **A01**
Sussex Univ., Brighton (England).
Microelectronics and the Garment Industry: Not Yet a Perfect Fit,
H. J. Rush, and H. K. Hoffmann. Nov 82, 10p
This article is from 'Information Technology and Development Series. Volume 2. Informatics and Industrial Development. Proceedings of the International Conference on Policies for Information Processing for Developing Countries Held at Dublin, Ireland on 9-13 March 1981,' AD-A130 796, p252-261.

Keywords: *Industrial plants, *Electronics, *Textile industry, *Economic analysis, Industrial engineering, Growth(General), Productivity, Economic impact, Developing nations, Exports, International trade, Strategy, Policies, Clothing, Manufacturing, Marketing, Symposia, Informatics, 'Industrial development, Third World Nations, Component reports.

Current North-South trade relationships and the underlying structural characteristics which determine the resultant international distribution of benefits set the context into which microelectronics based innovations (MBIs) will be introduced. Any speculation on possible scenarios regarding the impact of microelectronics on the Third World must take these contextual factors into consideration. One of the most significant of these factors is the phenomenon of Third World industrialisation efforts which have led to fairly significant increases in the export of manufactured products. Rates of growth of manufactured exports averaged around 26 per cent per year during the 1970s. These aggregate growth rates, although impressive, do not necessarily reflect the situation of individual nations since developing countries are by no means a homogeneous group. Different countries have experienced varying degrees of success in increasing the value and volume of their manufactured exports. This is largely due to differences between countries in terms of the structure of their economies and the orientation of their industrialisation strategies. Underlying these differences are factors likely to be crucial in determining the ability of these countries to respond to changes in trading conditions brought about by the use of MBIs.

AD-P001 481/1/GAA PC **A02**/MF **A01**
Warwick Univ., Coventry (England).
New Technology and Employment: Extensions to the Case of Developing Countries,
P. Stoneman. Nov 82, 14p
This article is from 'Information Technology and Development Series. Volume 2. Informatics and Industrial Development. Proceedings of the International Conference on Policies for Information Processing for Developing Countries Held at Dublin, Ireland on 9-13 March 1981,' AD-A130 796, p252-261.

Keywords: *Technology transfer, *Employment, *Economic analysis, Economic impact, Industrial production, Industrial engineering, Economic models, Income, Costs, User needs, Symposia, Informatics, *Industrial development, Third World Nations, Component reports.

The main purpose of this work is to attempt to get away from the microeconomic analysis of much of the work on the impact of new technology and to consider the macroeconomic questions. If a firm uses microelectronic technology then it may well produce a given level of output with less labour. However the impact on the demand for labour in the whole economy depends on many other factors and that is what is discussed here. The main body of the work reported on here was designed for the analysis of a closed developed economy. In the Appendix the details of the model itself are discussed. In section 2 we report on the employment paths that the model predicts will result from the introduction of new technology, and at that stage we will keep formal analysis to a minimum to save space and improve clarity. In section 3 we discuss the issues that will arise when the model is extended to an open economy. In section 4 the issues that are relevant in the developing economy context will be discussed. In section 5 conclusions are drawn.

AD-P001 495/1/GAA PC **A02**/MF **A01**
Computronics, New Delhi (India).
Appropriate Informatics in Industry: A Third World Viewpoint,
Utpal K. Banerjee. Nov 82, 11p
This article is from 'Information Technology and Development Series. Volume 2. Informatics and Industrial Development. Proceedings of the International Conference on Policies for Information Processing for Developing Countries Held at Dublin, Ireland on 9-13 March 1981,' AD-A130 796, p377-387.

Keywords: *Information systems, *Technology transfer, Information transfer, *Computers, Automation, Industrial production, Industrial engineering, Operation, Control systems, Management, Control, Strategy, On line systems, Off line systems, Batch processing, Planning, Management information systems, Symposia, Informatics, *Industrial development, Third world countries, Component reports.

Typically, operational control processes in industry are most susceptible to improvement with recursive learning situations. In fact, the statistical and O.R. models can be progressively made both sophisticated and comprehensive, as logical fallacies and missing data are identified with passage of time. At the managerial control level, the learning situation is almost wholly human, although it can cope with advantage with better monitoring and planning reports from the data-processing system. 'Appropriate Informatics' will pave the way to such judicious applications which can bring the best results to industry in the Third World.

AD-P002 132/9/GAA PC **A02**/MF **A01**
Texas Agricultural Experiment Station, College Station.
Shrimp Mariculture: Positive Aspects and State of the Art,
A. L. Lawrence, M. A. Johns, and W. L. Griffin. Oct 83, 24p
This article is from 'Dredging Operations Technical Support Program. Aquaculture in Dredged Material Containment Areas. Proceedings Held at Galveston, Texas on September 1982.' AD-A135 075, p55-78.

Keywords: *Fisheries, State of the Art, Economics, United States, Risk, Component Reports, Shrimp mariculture.

The emergence of shrimp mariculture as a new agricultural crop in the United States will occur during the next five years. Shrimp culture will not only provide food for human consumption and bait for the recreational fishery, but also there is the possibility of providing seedstock to supplement natural shrimp populations. The price of shrimp is high with shrimp representing the most valuable of the United States' fisheries. At this time, investment in shrimp mariculture has higher risk associated with it than other, more established industries. Several reasons for this increased risk are: limited technology, the conversion from a research and development phase to a commercial phase, and the absence of established commercial ventures. Adding to the risk is the large initial capital outlay for construction of ponds to establish a commercial size operation.

DE82000029/GAA PC **A22**/MF **A01**
Grand American, Inc., Yuma, CO.
Corn to Ethanol Plant Feasibility Study.
Feb 81, 507p DOE/RA/50311-T1
Contract FG07-80RA50311

Keywords: *Ethanol, *Bioconversion, *Industrial plants, *Corn, Availability, Biomass conversion plants, By-products, Colorado, Competition, Design, Distillers dried grains, Economic analysis, Electricity, Environmental impacts, Feasibility studies, Labor, Legal aspects, Maize, Market, Production, Raw materials, Socio-economic factors, Supply and demand, Technology assessment, ERDA/090222, ERDA/140504, ERDA/299003.

The purpose of this study is to assess the technical and economic feasibility of a corn to fuel grade ethanol plant in Colorado. The results of this feasibility study indicate that the Grand American project is commercially viable both from an economic and technical standpoint. The results of the economic and risk analysis show a 32.7 percent rate of return based on present state and federal fuel tax exemption legislation. The plant design is based on Raphael Katzen technology which has been used for several years in existing ethanol facilities. Pace does not foresee any technical problems with the facility. Markets for the ethanol appear to be the least secure aspect of the project at this point, although demand is expected to sufficiently increase to provide ample markets. The by-product market for the dried distillers grains (DDGS) appears to be supply limited. Raw materials for plant operation, including corn, power, water, and coal are readily available. (ERA citation 07:010396)

DE82000097/GAA PC **A14**/MF **A01**
Oak Ridge National Lab., TN.
Review of Open Literature on Effects of Chlorine on Aquatic Organisms.
D. M. Opresko. Aug 80, 320p EPRI-EA-1491
Contract W-7405-ENG-26

Keywords: *Water pollution, *Aquatic plants, *Ecology, Antifoulants, Aquatic ecosystems, Behavior, Chemical reactions, Chlorine oxides, Growth, Once-through cooling systems, Organic chlorine compounds, Physiology, Reproduction, Respiration, Reviews, Thermal power plants, Tolerance, Toxicity, Water pollution, ERDA/560302, ERDA/560304, ERDA/560305, ERDA/520200, ERDA/200200.

The pre-1980 open literature on the chemistry and biological effects of chlorine in marine, freshwater, and estuarine systems is reviewed with special emphasis placed on the potential impacts of power plant chlorination practices. Information is provided on aqueous chlorine chemistry including the types and relative concentrations of residual oxidants formed under varying environmental conditions; the stability, persistence, and reactivity of these oxidants; and their potential for forming halogenated organic compounds. Analytical methods for differentiating and measuring chlorine-produced residual oxidants are discussed in a separate section. Information on biological effects, derived mainly from the results of laboratory bioassays, consists primarily of acute toxicity data, but also included are discussions of biological and environmental factors affecting species' tolerance levels; sublethal effects on reproduction, growth, behavior, and physiological processes such as respiration and osmoregulation; and possible mechanisms of oxidant toxicity at the cellular or biochemical level. The final chapter considers the relative efficiency and potential environmental impact of alternative chemical and physical methods for controlling biofouling in power plant cooling systems. (ERA citation 06:035521)

DE82000930/GAA PC **A02**/MF **A01**
Department of Energy, Washington, DC. Assistant Secretary for Conservation and Renewable Energy.
Daylighting.
Sep 81, 12p DOE/CE-0022

Keywords: *Construction, *Buildings, Calculation methods, Control systems, Design, Lighting systems, Sun shades, ERDA/320104.

A catalog focusing on daylighting design and calculation methods in commercial buildings is presented. Primary sources of daylight in buildings are described briefly. Problems of appropriate design to maximize the use of daylighting; lighting controls; and operable sun control devices are discussed. (ERA citation 06:035012)

DE82001113/GAA PC **A07**/MF **A01**
Charles River Associates, Inc., Boston, MA.
Analysis of the Interaction of the Coal and Transportation Industries in 1990.
Sep 81, 148p DOE/EIA/10605-T1
Contract AC01-79EI10605

Keywords: *Coal, *Transportation, *Industrial plants, Calorific value, Coal mining, Consumption rates, Cost, Economic analysis, Electric power, Forecasting, Market, Mathematical models, Prices, Quantity ratio, Rail transport, Regulations, Sensitivity, Sulfur, Transport, Usa, ERDA/015000, ERDA/012000, ERDA/013000.

The developments in petroleum markets over the last decade have resulted in coal reemerging as a major fuel, especially in electricity generation. Many sectors of US society will be affected by the future interaction of the US coal and transportation industries. This study analyzes the impacts of major developments in coal transportation on coal production, prices and markets. Coal and coal transportation markets have special characteristics that must be accommodated if an analysis is to be useful. First, coal of differing energy and sulfur contents is produced in different regions in the United States. The transportation options from these supply regions to the various coal demand regions also differ. The market boundary between coal supply regions depends on the end-use cost to the final purchaser of using coal from each source. The differences in coals and transportation options imply that no simple rule of thumb will yield the end-use cost from competing supply regions at a given site, so market boundaries cannot be identified simply. Second, at most sites, one fuel, say coal from a given region, will clearly have a lower end-use cost than the others. However, there is no unique answer to the question of how the benefits from this lower cost at a given site are shared among the parties involved. Finally, the current status of the coal market is not a reliable guide to the future, because of ongoing changes in relative real fuel prices, the regulatory rules that railroads follow, and environmental constraints on utilities. The approach used instead in this study is to trace the logical implications of possible developments. The goal of the study is not to predict what coal market prices and production actually will be in 1990, but rather to examine the differences that specific transport rate developments might make. (ERA citation 07:006725)

DE82005626/GAA PC **A08**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Enzymatic Hydrolysis of Cellulose: Theory and Applications.
C. R. Wilke, B. Maiorella, A. Sciamanna, K. Tangnu, and D. Wiley. Jun 80, 172p LBL-13669
Contract W-7405-ENG-48

Keywords: *Enzymes, *Cellulose, *Ethanol, Reviews, Cellulase, Enzyme activity, Batch culture, Continuous culture, Xylanase, Biosynthesis, Agricultural wastes, Fluidized bed, Clostridium thermocellum, Chemical reaction yield, Cellulolytic activity, Chemical reactors, Water removal, Distillation, ERDA/090222, ERDA/140504, ERDA/550700.

A large amount of research has been published on the theory of enzymatic hydrolysis and the various microbial, and other, sources of the enzymes. The present report endeavors to supplement this information by emphasizing insofar as possible the status of the technology and of potential industrial processes for production of sugars from cellulose. A substantial research effort on cellulose conversion has been underway in the authors' laboratories at the University of California at Berkeley over the past ten years. This report is based in part upon this background of experience, and experimental data from relatively recent studies are presented in certain sections to make the information as timely and useful as possible. Because of current interest in production of ethanol a section is included which summarizes various methods for high productivity fermentation systems. Chapter titles are: Theory of enzymatic hydrolysis; production of cellulase and xylanase; hydrolysis of agricultural residues, enzymatic hydrolysis processes, high productivity ethanol fermentation; and ethanol economics.

DE82005649/GAA PC **A03**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Design of a Small-Scale Lignocellulose Plant for Ethanol Production.
J. Jacoby, L. Kirol, and S. Leeper. Jun 81, 37p EGG-M-03781, CONF-811108-16
Contract AC07-76ID01570
Annual meeting of the Institute of Chemical Engineers, New Orleans, LA, USA, 8 Nov 1981.
Best available copy from document source. Microfiche only after original copies are exhausted.

Keywords: *Industrial plants, *Corn, *Ethanol, Plant layout, *Agricultural wastes, Maize, Hydrolysis, Enzymatic hydrolysis, Cellulose, Pilot plants, Ethanol plants, Alcohol fuels, Fermentation, Distillation, Glucose, Ethanol, ERDA/140504, ERDA/090222.

A pilot plant has been designed to convert straw and corn stover to ethanol using the autohydrolysis pretreatment process. The unit also uses enzymatic conversion of cellulose to glucose, and simultaneous fermentation of glucose to ethanol. The autohydrolysis is a batch process, while saccharification and fermentation is a batch-fed continuous process. The plant is a modular front-end processor that interfaces with the Department of Energy's reference Small Scale Fuel Alcohol Plant (SSFAP) in Idaho Falls, Idaho. Although intended to pilot a large commercial alcohol plant, the unit may hold promise for small scale production of ethanol from crop residues. The plant requires only minimal modification of the existing starch alcohol plant, which can be used for either starch or lignocellulose once the conversion is made.

DE82006012/GAA PC **A04**/MF **A01**
XENERGY, Lexington, MA.
Reducing Energy Costs in the Plastics Industry.
1980, 58p DOE/CS/20295-3
Contract AC01-79CS20295

Keywords: *Plastics, *Industrial plants, Cost, Energy supplies, *Energy conservation, Energy efficiency, Investment, Energy management, Maintenance, Processing, Lighting systems, Space heating, Cooling systems, Payback period, ERDA/320300, ERDA/320104.

The handbook presents ideas and techniques for energy conservation in the plastics industry. Case studies were developed for a number of plastics plants in the US. Analyses were made of how each plant uses energy and what the potential was for saving energy dollars in each one. Specific recommendations are discussed on how to reduce the cost of process energy;

reduce lighting costs; and reduce heating and cooling costs.

DE82006285/GAA MF **A01**
Bechtel Group, Inc., San Francisco, CA.
Energy-Supply Planning-Model Documentation. Final Report.
Sep 81, 471p BNL-30278-V.1
Contract AC02-76CH00016
Available in microfiche only.

Keywords: *Energy source development, *Energy, Computerized simulation, Planning, Manuals, Documentation, Energy shortages, Materials, Labor, Social impact, Economic impact, Energy demand, ERDA/292000, ERDA/290100, ERDA/290200.

The Energy Supply Planning Model (ESPM) provides a systematic means of calculating, for any candidate energy development strategy, the total direct resources (capital, labor, materials, equipment, land, water, and energy) required to build and operate the energy-related supply facilities needed for the strategy. The model is used to analyze the feasibility and impacts of proposed strategies. The model has been modified to specifically address issues of importance to energy planning for developing countries and has been adapted for use in studies for Egypt, Indonesia, Peru, Portugal, and South Korea. Computer programs have been developed to assist in the adaptation process. The characteristics of the ESPM model are given. The results of the model may be used to analyze the economic and other related impacts of energy strategies. By virtue of the extent of detail in its results, the ESPM can help identify labor, materials, and equipment categories for which shortages may occur unless remedial actions are taken. These results can be used to investigate their impacts on specific sectors of the economy in order to determine manufacturing capacity and labor force expansion needs. This manual contains the information required to make ESPM applications once the model has been made operational on a computer system. It is designed to guide an ESPM user through input data preparation, program execution, and output evaluation. Section 2 of this report provides an overview of all the ESPM subprograms, including descriptions of the functions and application of each subprogram. The remaining sections of the report provide data input forms, a detailed description of each input, and sample run decks and reports for each subprogram.

DE82007597/GAA PC **A13**/MF **A01**
IIT Research Inst., Chicago, IL.
International Market Assessment of Stand-Alone Photovoltaic Power Systems for Cottage-Industry Applications.
T. M. Philippi. Nov 81, 284p DOE/NASA/0197-1, NASA-CR-165287
Contract AI01-76ET20485

Keywords: *Photovoltaic power system, Andes, Appropriate Technology, Bibliographies, Brazil, Caribbean Sea, Central America, Comparative Evaluations, Diesel Engines, Economic Analysis, Economic Development, Employment, Labor, Market, Mexico, Morocco, Philippines, Power Demand, Rural Areas, ERDA/140600, ERDA/299001.

The study focused on nonindustrialized countries with non-centrally planned economies. Cottage industries were defined as small rural manufacturers, employing less than 50 people, producing consumer and simple products. The data to support this analysis were obtained from secondary and expert sources in the US and in-country field investigations of the Philippines and Mexico. Results of the study are that the near-term market for photovoltaics for rural cottage industry applications appears to be limited to demonstration projects and pilot programs. This conclusion is based on an in-depth study of the nature of cottage industry, its role in the rural economy, the electric energy requirements of cottage industry, and a financial analysis of stand-alone photovoltaic systems as compared to ther most viable competitor - diesel driven generators. The study shows that photovoltaics are a better long-term option only for very low power requirements. Some of these uses would include clay mixers, grinders, centrifuges, lathes, power saws and lighting of a workshop. (ERA citation 07:046275)

DE82007987/GAA PC **A03**/MF **A01**
Lawrence Livermore National Lab., CA.
Managing for Safety.
S. R. Trost. Oct 81, 26p UCID-19283
Contract W-7405-ENG-48

Keywords: *Safety, *Management planning, *Occupational safety and health, Accidents, Management, Planning, Safety engineering, ERDA/570000.

In ordr to institute an effective accident prevention program and to preserve a safe working environment, all levels of management must be committed to the program's implementation and improvement. This paper reviews accident prevention techniques, provides an overview of accident prevention philosophy, summarizes data from surveys done in the field of accident prevention, and suggests criteria to be used in developing a safety plan.

DE82009009/GAA MF **A01**
Department of Energy, San Francisco, CA. San Francisco Operations Office.
Territorial Energy Assessment. Phase I.
31 Jul 81, 307p DOE/NBM-2009009
Portions of document are illegible.
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Keywords: *Puerto Rico, *Energy, *Research and development, Energy supplies, Energy demand, Guam, Mariana Islands, *Technology assessment, Economic development, Appropriate technology, Renewable energy sources, Energy source development, Economy, Political aspects, ERDA/292000.

The goal of the project is to provide a current perspective on territorial energy problems, to identify existing energy supply and demand data, and to identify energy resources that might be developed and appropriate technology options. The cost of the technical assessment and economic analysis activities required to support the development of specific energy plans is defined and estimated. Information is summarized for the US Territories, the Pacific Trust Territories, and Puerto Rico. An overview and analysis of the the Pacific Island Entities; profiles of the Pacifc Island Entities; and the Caribbean Island Entities are presented. (ERA citation 07:047093)

DE82009571/GAA PC **A03**/MF **A01**
Southern Solar Energy Center, Atlanta, GA.
Solar Industrial-Process-Heat Applications for Roche Products, Inc., Manati, Puerto Rico.
W. T. Studstill, and L. L. Leonaitis. 12 Mar 80, 27p SSEC/TP-43123
Contract AC02-79CS30166

Keywords: *Solar energy, *Industrial plants, *Solar heating systems, Solar space heating, Recommendations, Feasibility studies, Compound parabolic concentrators, Puerto rico, Boilers, Solar water heating, ERDA/140905, ERDA/140901.

The prime applications for solar industrial process heat (SIPH) at the Roche Products, Inc., facility using current state-of-the-art solar technology are: solar hot water for preheating and reheating conditioned air in building No. 201, and preheating boiler make up water at the Energy Center. Each of these two applications have two options on solar system design approach. The two options are: (1) attempt to satisfy total daily demand (storage employed), and (2) attempt to satisfy noon peak load only when solar radiation is available (no storage employed). The two applications which do not employ storage could displace 3162 barrels of oil annually, which represents approximately 21.5% of the plant's present oil consumption. This should yield a $110,600 fuel savings the first year based on $35 per barrel fuel oil. When combined with the power correction opportunity, the first year's savings should be approximately $122,600. The capital investment of the two solar IPH installations is estimated to be: Application 1, 50,000 sq ft array, $1,500,000, and Application 2, 2560 sq ft array, $70,727. SSEC recommends, as a first application, that Roche Products, Inc., install Application 2, the 2560 sq ft solar system, to gain operating and installation experience before proceeding with the 50,000 sq ft system.

DE82010437/GAA MF **A01**
Michigan Univ., Ann Arbor. School of Natural Resources.
Vegetation Classification in Arid Environments: An Alternative Approach.
D. L. Robel. 1982, 6p EGG-1183-1813, CONF-820110-1
Contract AC08-76NV01183
International symposium on remote sensing of environment: remote sensing of arid and sami-arid lands, Cairo, Egypt, 19 Jan 1982.
Available in microfiche only.

Keywords: *Arid land, *Plants(Botany), Classification, Remote sensing, Topography, Soils, Albedo, ERDA/510100.

Remote sensing in an arid environment differs in many significant respects from application of the same technology in temperate climates. In order to overcome the limitations of traditional classification techniques which rely heavily on vegetation greenness, an alternative approach to vegetation classification is presented. The approach was devised based on studies in the Southwestern United States over several years. It involves the assessment of a number of conditions, including whether the vegetation is green or not, consists of a variable or monotypic community, whether the underlying soils are of variable or uniform albedo, and the extent of the topographic relief. Classification procedures to use for various combinations of these conditions are suggested.

DE82010534/GAA PC **A03**/MF **A01**
Helstad (Scott), La Crosse, WI.
Alcohol Production from Cheese, Whey and Corn for a Farm-Size Operation. Final Report, July-December 1981.
S. Helstad. 24 Dec 81, 35p DOE/AF/92018-2
Contract FG02-81AF92018

Keywords: *Ethanol, *Corn, *Bioconversion, Production, Fermentation, Distillation, Farms, Batch culture, Economics, Cost, Efficiency, ERDA/090222, ERDA/140504.

The goal of this project was to construct a farm size alcohol distillery, capable of producing 200,000 gallons per year of equivalent 200 proof alcohol that is both labor and energy efficient. The distillery was completed in October and was operated on a weekly basis. It has taken until mid-November to work many of the bugs out. This operation is now capable of demonstrating the energy consumption and economics of producing alcohol on a small scale. The data and conclusions that can be made from results achieved so far are: (1) a batch process can be energy efficient if it operates at an optimum level; (2) the cost of producing alcohol in small batch operations is likely to be prohibitive; and (3) it is doubtful a farmer could construct a small, efficient distillery alone.

DE82010913/GAA MF **A01**
Hague International, South Portland, ME.
Enhancement of Energy Savings Through Accelerated Implementation of High-Performance Forge Furnaces. Final Technical Report.
Feb 82, 138p DOE/CS/40335-T1
Contract FC01-80CS40335
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Keywords: *Waste heat utilization, Furnaces, Market, *Ceramics, Training, Cooperation, Waste heat, Heat recovery, Maintenance, Contracts, Federal assistance programs, Financial incentives, *Forging, ERDA/320304, ERDA/320303.

Hague International successfully demonstrated under both controlled and actual production conditions that a well designed slot forge furnace equipped with a ceramic recuperator could consume as much as 65% of the fuel normally consumed by a forging furnace. Thus the Department of Energy, entered into a cooperative agreement to accelerate the introduction of Hague International's high efficiency slot forge furnace into the forging industry. This report details the basis of the cooperative agreement and the history of the host sites covered by the agreement. Fifteen (15) host sites participated in the program. (ERA citation 07:044048)

DE82011019/GAA PC **A02**/MF **A01**
EG and G Idaho, Inc., Idaho Falls

Design, Construction, Operation, and Costs of a Modern Small-Scale Fuel-Alcohol Plant.
S. A. Leeper, L. J. Dawley, J. H. Wolfram, G. R. Berglund, and J. G. Richardson. Jan 82, 17p EGG-M-11781, CONF-820127-2
Contract AC07-76ID01570
Annual conference on energy from biomass wastes, Lake Buena Vista, FL, USA, 25 Jan 1982.

Keywords: *Plant layout, *Industrial plants, *Ethanol, Design, *Construction, Operation, Cost, Maize, Microprocessors, Energy conservation, ERDA/140504, ERDA/090222, ERDA/299003.

The design used for the Small-Scale Fuel Alcohol Plant (SSFAP) has overcome the major drawbacks of small-scale ethanol production, which are high labor requirements, batch operation, inefficient energy use, and low yields. By incorporating a microprocessor into the plant design, most plant operations have been automated and labor requirements have been reduced. Continuous processing has made energy conservation possible, thus reducing energy requirements. A low-temperature, continuous plug-flow cooker design has made high yields possible. Ethanol has been consistently produced at the SSFAP from corn at a yield of 2.6 gallons (anhydrous) per bushel and an energy requirement of 30,000 to 35,000 Btu/gallon (190-proof). In addition, barley, grain dust, and potato waste have been converted at the SSFAP. The capacity of the SSFAP is 180,000 gallons per year (300 days operation). Competitively priced ethanol is produced at this capacity. DOE intends that the SSFAP design be used as the reference design for small-scale ethanol production.

DE82011220 GAA PC **A02**/MF **A01**
Washington Univ., Seattle. Dept. of Chemistry.
Rubber Elasticity. June 15, 1981-June 14, 1981.
B. E. Eichinger. 1981, 8p DOE/ER/10912-1
Contract AT06-81ER10912

Keywords: *Research and development, *Rubber, Swelling, Solvent properties, Research programs, Synthesis, Cross-linking, Styrene, Isoprene, Experimental data, ERDA/360403, ERDA/360401.

Progress on the following three projects are described: swelling of elastomers by diluents; theoretical analysis of the dynamics and thermodynamics of random networks; and synthesis of elastomers with metal-chelate crosslinkages. Five elastomer-solvent systems were investigated. In all cases polydimethylsiloxane was used with either cyclohexane or benzene or both. The comparison established the general validity of Flory's new constrained junction theory. However a slight revision of the theory was required. Theoretical work on amorphorus systems centered on evaluation of the density states for models (constructed by others) of amorphorus silicon, As sub 2 O sub 3 , etc. The utility of these models are being assessed. A batch of styrene-isoprene elastomer was prepared and is undergoing stress-strain measurements.

DE82012026/GAA PC **A03**/MF **A01**
Brookhaven National Lab., Upton, NY.
Energy Tarification and Investment Requirements in Developing Countries: An Accounting Model for Tunisia.
P. Meier. 1981, 47p BNL-30958, CONF-811190-1
Contract AC02-76CH00016
28. North American Regional Science Association meeting, Montreal, Canada, 15 Nov 1981, Portions are illegible in microfiche products.

Keywords: *Tunisia, *Fuels, *Financial management, *Energy, Energy supplies, Prices, Tariffs, Mathematical models, Institutional factors, Electric utilities, Pricing regulations, Marginal-cost pricing, Petroleum industry, Energy models, ERDA/020700, ERDA/294002, ERDA/290200.

The pricing of energy products is one of the major problems facing the developing countries of the Third World, particularly in those that are oil importers. The general pattern is for petroleum products other than gasoline to be heavily subsidized, and for gasoline to be heavily taxed, a policy based largely on social considerations (shield the rural poor from kerosene price increases, aid industrial development, etc.). Many energy planners, and certainly the World Bank and the IMF if not other financing institutions, have long argued the need for change. Pricing and tariffs based on marginal cost is the almost universal prescription; and at a minimum the subsidies on certain petroleum products should be reduced. The accounting model presented in this paper is designed as a tool for the policy analyst rather than the theoretician, and emphasizes the practial dimensions of the tarification and energy taxation problem. In the case of Tunisia, the institutional structure can be very complex, with a multiplicity of taxes and transactions supporting the price system in place. Making even simple changes to the system is therefore likely to affect several entities simultaneously; and to implement the recommendations of the financing institutions is therefore beset by numerous practical problems. (ERA citation 07:052677)

DE82013313/GAA MF **A01**
Donovan, Hamester and Rattien, Inc., Washington, DC.
Task XVIII. Technology Base Assessment.
30 Jun 80, 39p DOE/CS/20059-T15
Contract AC01-78CS20059
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Keywords: *Technology assessment, *Solar energy, *Energy conservation, *Energy, Global aspects, Investment, International cooperation, Constraints, Economy, Trade, Market, Foreign policy, International agreements, Program management, Economic growth, Energy demand, ERDA/140000, ERDA/291000.

International Conservation and solar energy activities are discussed in view of the enormous increase in oil prices. The current economic outlook of non-oil producing countries is examined. The specific international US energy activities and programs relating to developed and developing countries are described. Problems facing international energy activities are examined. Information on the regional US solar energy centers is included. (ERA citation 07:042721)

DE82014180/GAA PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Energy Planning for Development - Needs and Approaches.
V. Mubayi. 1981, 14p BNL-31208, CONF-811196-1
Contract AC02-76CH00016
International scientific forum on changes in energy, Mexico City, Mexico, 9 Nov 1981.

Keywords: *Economic development, Training, *Energy, Planning, Information needs, ERDA/290200.

The capability of developing countries to carry out comprehensive national energy planning is examined. The analytical methods or models constructed for analyzing the energy system have to take into account the specific context in which they are built to address issues of interest to development planners. Issues discussed are resource development and technology research, energy equity considerations to all peoples in a nation, the pricing policy, and the balance of payments considerations. The impartance of the availability of adequate skilled personnel and training programs to impart the requisite skill necessary to carry out the planning is discussed. Various surveys were conducted to determine the training needs for energy planners in developing countries. (ERA citation 07:043794)

DE82014245/GAA PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Toxicity of Silicon Compounds.
K. M. Novak. Jun 81, 14p BNL-51509
Contract AC02-76CH00016

Keywords: *Health, *Occupational safety and health, *Toxic substances, *Safety, Toxicity, Biological pathways, Public health, Health hazards, Dusts, Particulates, Occupational safety, ERDA/560306, ERDA/140400.

Silica toxicity was reviewed relative to assessing the health risks from a developing photovoltaic industry. Mechanism of physiological damage, possible exposure pathways of concern, and potential occupational and public hazards were examined. Acute and chronic effects were differentiated and appropriate methods for quantitative risk assessment described. (ERA citation 07:044825)

DE82016609/GAA PC **A05**/MF **A01**
Brookhaven National Lab., Upton, NY.
Energy Models for Developing Countries: A Comparative Assessment.
V. Mubayi, and P. M. Meier. Jun 81, 88p BNL-51446
Contract AC02-76CH00016
Portions of document are illegible.

Keywords: *Energy, *Energy source development, *Technology assessment, Comparative evaluations, Prices, Economic policy, Decision making, Peru, Portugal, Republic of Korea, ERDA/290100.

An overview, with emphasis on the methodologies and models employed of various energy sector assessments that have been carried out in developing countries is presented. The analytical tools and methods used can become the basis of an ongoing energy planning activity. A brief overview and discussion of some of the World Bank energy sector assessments and the analytical methods used in making them are provided. The preliminary conclusion is that these methods need to be considerably extended, especially with regard to economics and technology, to serve the Bank's own goals of integrating energy sector planning with overall economic planning. The methodology of the Reference Energy System approach that was used in the energy assessments of Peru and Egypt is introduced and a discussion of its limitations and the need for further extensions is included. The use of this approach in the Peru assessment is illustrated and a detailed account of its extension, including energy-economic linkages as used in the Portugal assessment and a similar ongoing assessment in Korea, is presented. A mathematical exposition of the full analytical approach to energy sector planning, portions of which have been implemented in the assessments in Portugal and Korea, is also presented. A brief account of the data needs and requirements for energy sector planning as determined by the methodology described and some concluding remarks on the methodological approaches are given. (ERA citation 07:043783)

DE82019163/GAA PC **A04**/MF **A01**
Solar Energy Research Inst., Golden, CO.
Evaluation of Pumps and Motors for Photovoltaic Water-Pumping Systems.
D. Waddington, and A. Herlevich. Jun 82, 57p SERI/TR-214-1423
Contract AC02-77CH00178
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Keywords: *Photovoltaic power system, *Water pumps, *Motors, Solar cell arrays, Performance testing, Comparative evaluations, Flow rate, Efficiency, Test facilities, Design, Electric batteries, Photovoltaic power supplies, ERDA/140600.

Two electric, motor-driven water pumps were tested in conjunction with a photovoltaic (PV) array that provided the electrical energy to run the pumps. The purpose of the tests was to evaluate the performance of currently available, low-cost pumping systems powered by PV arrays. The performance and cost of these systems were compared with analogous data from similar, higher priced pumps and motors currently used with many PV water pumping systems. The two pump systems considered represent production equipment available from U.S. industry and cost less that 50% of equivalent pumps installed with PV pumping systems in the United States and in developing countries. Flow rates, pumping heads, and efficiency were comparable in both test pumps and equivalent pumps. Motor performance when the motor was directly connected to the PV array and loaded with the pump was examined. The conclusion drawn from this experiment is that commercially available, low-cost water pump systems will perform satisfactorily when powered by PV arrays. The test facility constructed for these tests consists of a trailer housing the instrumentation, controls and pump subsystem, and two solar arrays that provided up to 1500 W/sub p/ power. Two battery storage subsystems provide instrumentation power when solar energy is not available. This facility can now be used for further tests, for orientation, or to provide hands-on training for persons interested in using PV-powered systems. (ERA citation 07:053380)

DE82019268/GAA MF **A01**
Indiana Laborers' Training Trust Fund, Bedford.

Midwest Appropriate-Technology Small Grants Program. Semiannual Technical Progress Report.
A. Hert. 26 Apr 82, 19p DOE/R5/10223-3
Contract FG02-80R510223
Portions of document are illegible.
Microfiche copies only.

Keywords: *Solar heating systems, Thermal energy storage equipment, Control systems, Temperature distribution, Design, Performance, Cost, ERDA/140901, ERDA/141000.

Four experimental air collectors are described with supporting test data given. Revisions to the air handling equipment and to the storage bin are described. A system for monitoring or control of the heating system is also described. A combination air-liquid collector has been constructed and experimented with to determine if an absorber plate with circulating liquid would substantially raise the surrounding case temperatures. Temperature data for this collector are also recorded. Some conclusions drawn from experiments with the described equipment are given, and a solar installation proposed for a maintenance building is described briefly. (ERA citation 07:056590)

DE82020273/GAA PC **A09**/MF **A01**
Brookhaven National Lab., Upton, NY.
Harnessing the Sun for Development: Actions for Consideration by the International Community at the UN Conference on New and Renewable Sources of Energy for Promoting the Use of Renewable Energy in Developing Countries.
Aug 81, 195p BNL-51463
Contract AC02-76CH00016

Keywords: *Solar heating systems, *Energy source development, *Renewable energy, Energy demand, Technology assessment, Economic analysis, Energy consumption, Zimbabwe, Retrofitting, Beverage industry, Recommendations, Constraints, Tax credits, Depreciation, Testing, Certification, Solar equipment, Standards, Training, Developing countries, Financial incentives, Legal incentives, Market, Uses, Industry, Usa, ERDA/140905, ERDA/299000.

The technical and economic evidence is reviewed for solar industrial process heat, highlighting the fact that financial parameters such as tax credits and depreciation allowance play a very large role in determining the economic competitiveness of solar investments. An analysis of the energy (and oil) consumed in providing industrial process heat in a number of selected developing countries is presented. Solar industrial process heat technology is discussed including the operating experience of several demonstration plants in the US Solar ponds are also described briefly. Financial and economic analysis of solar industrial process heat systems under different assumptions on future oil prices and various financial parameters is described. Financial analyses are summarized for a solar industrial process heat retrofit of a brewery in Zimbabwe and a high efficiency system operating in financial conditions typical of the US and a number of other industrialized nations. A set of recommended policy actions for countries wishing to enhance the commercial feasibility of renewable energy technologies in the commercial/industrial sector is presented. Various barriers and remedies to development of solar process heat are discussed including the potential role of international financial institutions such as the World Bank and the regional development banks. The issues of test and certification procedures for solar equipment, establishment of standards, and the training of personnel are analyzed. (ERA citation 07:056584)

DE82901472/GAA PC **A04**/MF **A01**
Pennsylvania Agricultural Experiment Station, University Park.
Agricultural Anaerobic Digesters: Design and Operation.
S. P. E. Persson, H. D. Bartlett, A. E. Branding, and R. W. Regan. Nov 79, 56p NP-2901472

Keywords: *Manures, *Biomass, *Bioconversion, *Agricultural wastes, Anaerobic digestion, Biogas process, Cattle, Design, Operation, Cost, Chemical reactions, Microorganisms, ERDA/140504, ERDA/090122.

The following are discussed: microbial and chemical processes, design and function of the digester system, operational procedure, storage and use of biogas and effluent, and costs of anaerobic digestion and biogas production from dairy barn manure.

DE82902018/GAA PC **A03**/MF **A01**
Maryland Univ., College Park. Agricultural Experiment Station.
Sterile Acceptable Milk (SAM): A Major Energy-Saving Technology. Summary and Recommendations.
Oct 80, 45p NP-2902018, MP-959

Keywords: *Sanitation, *Milk, Protein denaturation, Nutrients, Standards, Pasteurization, Refrigeration, Legal aspects, Economics, Sterilization, Preservation, Containers, Ultrahigh temperature, Glass, Paper, Metals, Marketing research, Packaging, Regulations, Data, Tables, ERDA/320303, ERDA/320301.

Milk consumption, its nutritive values, and its sanitation and preservation are reviewed. The production of sterile milk as an alternative to pasteurized milk is discussed. A technical assessment of the feasibility of introducing sterile acceptable milk (SAM) into the American economy and the energy and economic impacts that would result are summarized. Research has demonstrated that milk sterilized as a free falling film in a saturated steam environment produced a product which consumers would find comparable to existing pasteurized milk. This bulletin provides an overview of the research project and presents highlights of the analysis.

DE83000102/GAA PC **A03**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Conserving Energy Through New Irrigation Technologies. Technical Briefing Report.
Jul 82, 32p PNL-4339
Contract AC06-76RL01830

Keywords: *Energy conservation, *Irrigation, *Agriculture, Energy consumption, Fuel consumption, Optimization, Efficiency, Water wells, Service life, Computerized control systems, Technology assessment, ERDA/320303, ERDA/291000.

The benefits and applications of five irrigation technologies are explored: mobile drop-tube irrigation, computerized scheduling, reduced-pressure center pivots, well design and development, and automated gated-pipe systems. Perhaps the most promising of the new irrigation technologies is the low-energy, precision-application (LEPA) system. This mobile system used one-half the energy of conventional sprinkler systems and distributes water with greater efficiency through a series of low-pressure drop tubes suspended above the crop. Computerized methods of irrigation scheduling have been developed to help farmers conserve water and energy. Special computer programs determine when a crop needs water and how much to apply for optimal plant growth, thus preventing the unnecessary costs of pumping more water than the crop needs. Field test results show that replacing traditional scheduling methods of irrigation with computerized scheduling can reduce energy and water use by as much as 35%. The irrigation industry is actively promoting reduced-pressure water application methods, particularly for center-pivot systems. Reduced-pressure systems expend less energy but produce the same crop yields as conventional high-pressure systems, as long as excessive water runoff does not occur. If well design and development techniques are applied when a well is drilled into an unconsolidated acquifer, the well's life expectancy, as well as its operating efficiency, can increase, the later by as much as 40%. (ERA citation 08:000703)

DE83000569/GAA PC **A06**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Evaluation of Research and Development Opportunities for Sensors and Controls in the Drying Process.
T. T. Semler, C. J. Pientka, J. R. Dixon, and J. D. Miller. Aug 82, 107p EGG-CS-5950
Contract AC07-76ID01570

Keywords: *Drying, *Industrial plants, Industry, *Agriculture, *Research and development, Mining, Food processing, Textile industry, Energy consumption, Probes, Humidity, Glass industry, Cement industry, Ceramics industry, Wood products industry, Chemical industry, ERDA/320303.

Processes are examined that consume large amounts of energy for drying in the following industries: agricultural production, mining, food processing, textiles, tobacco, lumber, chemicals, pulp and paper, and stone, clay, glass, and concrete products. Recommendations are made and research and development initiatives are identified for those areas where energy conservation could be achieved with improved sensors and controls to monitor drying. Energy use for drying in various industries is reported, or estimated if statistics are unavailable. Total industrial energy use for drying is estimated. Different types of dryers are described and a variety of humidity measurement devices are examined. (ERA citation 08:000700)

DE83001278/GAA PC **A04**/MF **A01**
Honeywell, Inc., Minneapolis, MN.
Optimization of Solar-Selective Paint Coatings. Final Report, September 15, 1980-June 15, 1982.
M. A. McChesney, P. B. Zimmer, and R. J. H. Lin.
Jun 82, 69p DOE/CS/14287-T2
Contract AC04-78CS14287

Keywords: *Paints, Optimization, Dip coating, Spray coating, Aluminium, Cost, Optical properties, Surface coating, Nickel, Pigments, Aging, Stabilization, Milling machines, Absorptivity, Emissivity, Experimental data, ERDA/141000.

The objective of this program was the development of low-cost, high-performance, solar-selective paint coatings for solar flat-plate collector (FPC) use and passive thermal wall application. Thickness-sensitive selective paint (TSSP) coating development was intended to demonstrate large-scale producibility. Thickness-insensitive selective paint (TISP) coating development was intended to develop and optimize the coating for passive solar systems and FPC applications. Low-cost, high-performance TSSP coatings and processes were developed to demonstrate large-scale producibility and meet all program goals. Dip, spray, roll, laminating and gravure processes were investigated and used to produce final samples. High-speed gravure coating was selected as the most promising process for solar foil fabrication. Development and optimization of TISP coatings was not completely successful. A variation in reflective metal pigment was suspected of being the primary problem, although other variables may have contributed. Consistent repeating of optical properties of these coatings achieved on the previous program was not achieved. However, a new method of achieving better control of coating components was conceived and preliminary development initiated. The new concept was described as an engineered pigment approach. The engineered pigment approach uses TSSP-coated metal foil particles instead of uncoated aluminum flakes in a liquid TSSP coating. The approach offers many advantages over the use of uncoated aluminum flakes: control of particle flatness, size, and thickness; control of the optical selectivity of each particle; and control of the liquid TSSP coating surrounding the coated particles. (ERA citation 08:012176)

DE83001654/GAA PC **A03**/MF **A01**
Marida, Inc., Washington, DC.
US Trade and Development Program. Energy Projects Data Sheets.
31 Aug 82, 29p DOE/CE/38004-T1
Contract AC01-82CE38004

Keywords: *Industrial development, *Energy, *Belize, *Brazil, *Jamaica, *Panama, *Tanzania, *Thailand, *Zimbabwe, Usa, Trade, Data compilation, Market, Global aspects, Electric power, Coal, Natural gas, Coal gasification, Hydroelectric power, Pipelines, Fossil-fuel power plants, Methanol, Biomass, Sugar cane, Saccharose, Feasibility studies, Energy policy, ERDA/290200, ERDA/290500.

Economic development of energy sufficiency programs for developing countries are planned cooperatively with the US. Feasibility studies are proposed using each nation's resources. (ERA citation 08:005288)

DE83001799/GAA PC **A09**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Potential Cost Savings from Investments in Energy-Conserving Irrigation Systems.
W. P. Patton, G. L. Wilfert, B. J. Harrer, M. A. Clark, and K. L. Sherman. Oct 82, 194p PNL-3930
Contract AC06-76RL01830

Keywords: *Irrigation, *Energy conservation, Cost, Comparative evaluations, Energy consumption, Water wells, Water pumps, *Economic analysis, Sensitivity analysis, ERDA/320300, ERDA/291000.

A comparative analysis is presented of the levelized costs of selected irrigation systems, with an emphasis on the costs and benefits of energy savings. The net economic benefits are evaluated, measured as energy cost savings minus additional capital and operating costs, of some energy-conserving systems. Energy use in irrigation and descriptions of both the conventional and the energy-saving technologies involved in the analysis are discussed. The approach used in the analysis is outlined, and comparative analysis results are discussed. Detailed cost information is presented by state. (ERA citation 08:005535)

DE83002064/GAA PC **A03**/MF **A01**
Los Alamos National Lab., NM.
Methodology for Minimizing Maintenance Costs.
L. Brice, and J. Connell. 1983, 27p LA-UR-82-2928, CONF-830501-1
Contract W-7405-ENG-36
IEEE national computer conference, Anaheim, CA, USA, 16 May 1983.

Keywords: *Maintenance, *Computers, Computer codes, Modifications, Cost, Programming, ERDA/420200.

Research conducted in the case study of a large applications system shows that the two primary causes of high maintenance costs are: the frequency of user-requested changes to software, and the psychological complexity of the software. A tool kit is suggested which, when applied to the design of new systems or rewrites, will produce systems which users are less likely to need changed, and will contribute to the reduction of psychological complexity of code, making it easier to change when necessary. The tool kit is easy to use, can be applied to large or small systems in any language on any equipment, and requires no purchase of hardware or software. (ERA citation 08:027001)

DE83002071/GAA PC **A02**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Steam Gasification of Wood in the Presence of Catalysts.
L. K. Mudge, D. H. Mitchell, E. G. Baker, R. J. Robertus, and M. D. Brown. 1982, 24p PNL-SA-9954-Rev.1, CONF-820685-3-Rev.1
Contract AC06-76RL01830
14. biomass thermochemical conversion contractor's meeting, Arlington, VA, USA, 23 Jun 1982.

Keywords: *Wood, *Methanol, *Gasification, Process development units, Testing, Computer codes, Catalysts, Synthesis gas, Production, ERDA/140504, ERDA/090122, ERDA/090222.

Catalytic steam gasification of wood, including sawdust, chipped forest slash, and mill shavings, is being investigated. Results of laboratory, process development unit (PDU), and feasibility studies illustrate attractive processes for conversion of wood to methanol and a substitute natural gas (SNG). Recent laboratory studies developed a long-lived alloy catalyst for generation of a methanol synthesis gas by steam gasification of wood. Modification of the PDU for operation at 10 atm (150 psia) is complete and initial tests have been completed. The modified PDU will be operated at elevated pressures to confirm yields and design parameters used in process feasibility studies. A computer program for evaluating the effect of yield changes on process economics was completed. The base case was the study on economics of methanol-from-wood using catalytic gasification. This study showed that methanol-from-wood by catalytic gasification was competitive with process for methanol production from natural gas. (ERA citation 08:001935)

DE83002199/GAA PC **A04**/MF **A01**
Booz-Allen and Hamilton, Inc., Bethesda, MD.
Evaluation Plan for DOE-SAN Appropriate-Energy-Technology Pilot Program.
1978, 71p DOE/CS/21693-T6
Contract AC03-77CS21693
Portions of document are illegible.

Keywords: *Technology assessment, *Research and development, Grants, Technology utilization, Program management, Inventions, Research programs, Evaluation, ERDA/290500.

The evaluation plan for a regional pilot Appropriate Technology small grants program is described. The program description covers the DOE mandate from Congress, the national DOE Appropriate Technology small grants program, and the regional pilot program in Federal Region IX. The evaluation process is covered. Sample questions for participants in the solicitation phase of the pilot program are presented. The peer review groups are listed. (ERA citation 08:005314)

DE83002312/GAA PC **A04**/MF **A01**
Los Alamos National Lab., NM.
Energy Supply and Demand in the Caribbean Region, 1978-2000.
C. J. Ruhm. Sep 82, 65p LA-9526-MS
Contract W-7405-ENG-36

Keywords: *Central America, *Research and development, *Energy supply, *Caribbean, Energy supplies, Energy demand, Gross domestic product, Forecasting, Economic elasticity, Commercial sector, Residential sector, Petroleum, Natural gas, Coal, Greater antilles, Surinam, Latin america, Nuclear power, Data compilation, Energy consumption, ERDA/298000.

This study discusses and projects energy demand for countries in and bordering the Caribbean Ocean through the year 2000. Forecasts, on a country-by-country basis, are formed using estimates for the gross domestic product growth rates, petroleum price increases, and income and price elasticities. Energy demand is generally concluded to rise during the forecast period, even with greater conservation efforts, but at a slower rate than in the past. The costs of imported energy are projected to increase faster than national incomes and in some cases may seriously adversely affect prospects for economic development. Energy demands are further projected on a sector-by-sector basis for Central American nations. These forecasts are consistent with results of the aggregated projections and indicate that for these countries, major efforts should be devoted towards reducing the transportation sector's demand for energy. (ERA citation 08:002430)

DE83002571/GAA PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Microstructural Influence on Abrasive Wear Resistance of High-Strength, High-Toughness Medium-Carbon Steels.
C. K. Kwok, and G. Thomas. Sep 82, 30p LBL-14911, CONF-830402-2
Contract AC03-76SF00098
International conference on weat of materials - mechanisms and control of wear, Washington, DC, USA, 11 Apr 1983.

Keywords: *Steel industry, Abrasion, Wear resistance, Microstructure, Mechanical properties, Tensile properties, Heat treatments, ERDA/360103.

A systematic study of abrasive wear resistance of Fe/Cr/Mn experimental steels has been carried out in two-body pin-on-disc abrasion tests. Silicon carbide, alumina, and quartz were used as abrasives. The relationships between microstructures, mechanical properties, and abrasive wear resistance for these experimental steels were studied. In addition, several commercial alloys were tested to provide a basis for comparison. Results show that dislocated lath martensite with continuous interlath film of retained austenite appears to be a desirable microstructure for good wear resistance. Grain refinement by double heat treatment was found to improve the toughness in the experimental steels but have little effect on the abrasive wear resistance. In general, superior tensile properties and wear resistance, without sacrifice in toughness, can be achieved by a lath martensitic microstructure. 8 figures. (ERA citation 08:021074)

DE83002857/GAA PC **A07**/MF **A01**
California Univ., Davis. Appropriate Technology Program.
Analytic Procedure for Classifiying AET Projects and Summarizing the DOE Small Grants Program. Final Report, 1978-1979.
P. J. Hunter, and P. C. Craig. 25 May 79, 126p DOE/SF/80086-T1
Contract AT03-76SF80086

Keywords: *Management techniques, *Research and development, Research programs, Grants, Program management, Data base management, ERDA/290500.

The classification methodology has been developed to categorize projects funded under the Appropriate Energy Technology Small Grants Program. The categorization can be used to: summarize the program regionally and nationally; compare changes in program emphasis between successive funding cycles; aid the development of a data base to be used in national program management; and to indicate projects that may have commercial potential. (ERA citation 08:010006)

DE83002977/GAA PC **A05**/MF **A01**
One America, Inc., Washington, DC.
Who's Who in Energy Recovery from Waste.
Oct 82, 97p DOE/CS/24312-5
Contract AC01-80CS24312

Keywords: *Renewable energy, *Waste recycling, Directories, Personnel, ERDA/320604, ERDA/320305, ERDA/290800.

This Directory provides a comprehensive listing of individuals and organizations actively involved in energy recovery from waste activities. More than 790 entries are included. A nationwide listing of waste-to-energy facilities in operation or under construction is provided. Information for this Directory was obtained through advertisements in the publications and newsletters of major trade associations, through direct mail solicitation, and through a literature review. For each organization, a key contact person is provided for obtaining further information. All entries are current as of June 15, 1982. (ERA citation 08:005579)

DE83003306/GAA PC **A05**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Methods for Evaluating the DOE Appropriate-Technology Program: A Review and Compilation of Evaluation Methods.
B. Lucarelli. Jul 82, 85p LBL-14782
Contract AC03-76SF00098

Keywords: *Renewable energy, *Management techniques, Program management, Evaluation, Economic impact, Wind power, Hydroelectric power, Anaerobic digestion, Weatherization, Geothermal space heating, Geothermal water heating, Solar water heating, Solar space heating, Passive solar heating systems, Data acquisition, ERDA/299000, ERDA/290500, ERDA/151000, ERDA/140901, ERDA/140504.

Procedures are described for evaluating the energy impact of renewable energy resource projects funded by the Appropriate Technology (AT) Program of the U.S. Department of Energy (DOE). A discussion of the various evaluation approaches used by LBL over the past two years, definitions of key concepts such as direct and indirect energy impact and cost-effectiveness, and recommendations of a simplified evaluation approach for the future are included. Appendix A contains detailed procedures for evaluating the direct energy impact from six renewable energy resource systems: (1) wind electric, (2) hydroelectric, (3) anaerobic digestion, (4) active solar water and space heating, (5) passive solar, and (6) geothermal space and water heating as well as weatherization. Appendix B defines economic concepts and presents a simplified approach for computing the cost-effectiveness of small energy projects. Appendix C has blank data forms that DOE can use to collect data from specific AT projects. Appendix D contains a table to help estimate the direct impact of passive solar systems. (ERA citation 08:010056)

DE83003483/GAA PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Physical-Property Estimation for Coal Liquids.
A. A. Khan, R. E. Barker, and J. M. Begovich. 1982, 38p CONF-821106-15
Contract W-7405-ENG-26
Annual meeting of heat transfer and energy conversion (American Inst of Chemical Engineers), Los Angeles, CA, USA, 14 Nov 1982.

Keywords: *Coal, *Industrial plants, Coal liquefaction, Physical properties, Correlations, Boiling points, Density, Molecular weight, Thermodynamic properties, Simulation, Src-ii process, Experimental data, Temperature dependence, Vapors, Liquids, Equilibrium, ERDA/010600, ERDA/010405.

Improved design of coal liquefaction facilities is dependent on the availability of accurate thermodynamic property estimation methods. However, since coal liquids are mixtures of a large number of pure components bound together in a complex heteroatomic group structure; traditional methods for estimating thermodynamic properties are often inapplicable. Three sets of physical properties correlations-Cavett (1962), Wilson (1981), and Starling (1980)-have been used in conjunction with the ASPEN simulator (MIT, 1981) to critically evaluate against experimental vapor-liquid equilibrium data the utility of ASPEN for simulating coal liquid separations. All three correlations were found to give close correspondence between predicted and experimental K-values for temperatures between 478 and 589 K at 13.89 MPa except for heavy boiling fractions. It was also found for the limited data examined from the SRC-II PDU vacuum flash unit that using Wilson's correlations with the Redlich-Kwong-Soave method in ASPEN predicts vapor mole fractions close to experimental results. The utility of ASPEN for coal liquids has thus been demonstrated. Examination of experimental data indicates that better boiling point characterization data, including improvements in measurements of specific gravity and molecular weight, may further improve simulation capabilities. (ERA citation 08:019544)

DE83003753/GAA PC **A02**/MF **A01**
Rockefeller Univ., New York.
Some Basic Research Problems Related to Energy.
1982, 10p DOE/ER/10807-7
Contract AC02-81ER10807

Keywords: *Research and development, *Heat transfer, *Energy, Research programs, ERDA/420400.

Two aspects are studied in this report. The first aspect is the prediction and evaluation of thermophysical data of fluids and fluid mixtures. Models will be constructed to calculate the transport properties of fluid mixtures in their dependence on size and mass of the constituent particles. The second aspect is the application of nonlinear evolution equations to energy related processes. It is expected that the remarkable progress in this field will have significant practical uses. (ERA citation 08:010506)

DE83003921/GAA PC **A06**/MF **A01**
Alliance to Save Energy, Washington, DC.
Third-Party Financing: Increasing Investment in Energy-Efficient Industrial Projects.
Nov 82, 123p DOE/CS/24448-T1
Contract FG01-80CS24448

Keywords: *Industrial development, *Industrial plants, *Energy conservation, Investment, Financing, Tax credits, Leases, Joint ventures, Contracts, Decision making, Depreciation, Risk assessment, ERDA/320300, ERDA/291000.

Four considerations in structuring a third-party financing approach are discussed. These are financing advantages, risk management, tax implications, and operating arrangements. The four basic third-party financing approaches discussed are leasing, joint venture, shared-savings plan, and energy services contract. Each approah differs in terms of financing advantages, risk management, tax implications, and operating arrangements, and can be structured to provide benefits to all participants, it is found. A case study analysis of a major industrial firm considering an actual energy investment was conducted. (ERA citation 08:012618)

DE83004387/GAA PC **A02**/MF **A01**
Sunpower, Inc., Athens, OH.
600-Watt Free-Piston Stirling Engine Generator. Final Report.
1981, 15p DOE/R5/10247-1
Contract FG02-80R510247
Portions of document are illegible.

Keywords: *Engines, Design, Testing, Appropriate technology, Commercialization, Power range 100-1000 w, Specifications, Computerized simulation, ERDA/320303, ERDA/140700, ERDA/425003.

The prototype free-piston Stirling-engine alternator has achieved 500 watts of power, 50 Hz, at average 500 exp 0 C heater head temperature on a solid fuel burner. Using standard scaling procedures, this machine will produce 780 watts, 60 Hz, at 700 exp 0 C. At this time, modifications are underway which will raise power and frequency to predicted levels. Additional tests are planned and a 2nd-generation design has been started. Future commercialization plans are described. (ERA citation 08:012622)

DE83004423/GAA PC **A03**/MF **A01**
Argonne National Lab., IL.
Industrial-Waste Exchange: A Mechanism for Saving Energy and Money.
L. L. Gaines. Jul 82, 49p ANL/CNSV-33
Contract W-31-109-ENG-38

Keywords: *Energy management, *Energy conservation, *Industrial wastes, *Waste recycling, Raw materials, Transport, Recycling, Regulations, Constraints, Oils, Solvents, Inorganic acids, Catalogs, Trade, ERDA/320305, ERDA/291000.

Industrial-waste exchanges have been established to assist in the transfer of waste materials to companies that can use them, as is or treated, to displace virgin raw materials as process inputs. A waste exchange may provide information that expedites the transfer, or it may actually take possession of the material. Benefits of industrial-waste exchange include avoided disposal costs and reduced energy and dollar costs for raw materials. Uses can be found for most wastes listed in waste-exchange catalogs, including spent acid, waste solvents, and used lubricating oils; substantial savings of energy and dollars are often possible through recycling of these potentially valuable materials. Lack of economical separation technology, the small quantities available at some sites, restrictive or uncertain regulation, and lack of knowledge of a material's uses are all barriers to successful operation of industrial-waste exchanges, but these barriers can be overcome by appropriate action. (ERA citation 08:010118)

DE83004518/GAA PC **A02**
Schrems (James M.), Saginaw, MI.
Appropriate Technology Small Grants Program: Shower Waste Heat Recouperator. Final Report.
J. M. Schrems. 12 Dec 82, 23p DOE/R5/10310-2
Contract FG02-81R510310
Paper copy only, copy does not permit microfiche production.

Keywords: *Waste heat utilization, Heat Recovery Equipment, Performance Testing, Temperature Monitoring, ERDA/320101.

A test stand was designed that would monitor temperatures and flow rates through the heat recuperator, and three heat recuperator variations were built and tested. The development of the recuperator and the test stand is photographically reported. Three tests were performed on each recuperator for three different flow rates. (ERA citation 08:010078)

DE83004644/GAA PC **A02**/MF **A01**
Oak Ridge Y-12 Plant, TN.
Technical Considerations in Choosing Alcohol Fuels for Less-Developed Countries.
J. M. Googin, A. L. Compere, and W. L. Griffith.
1982, 16p CONF-821213-2
Contract W-7405-ENG-26
International conference on alternative energy source, Miami Beach, FL, USA, 13 Dec 1982.

Keywords: *Alcohols, *Ethanol, *Fuels, Alcohol fuels, Fuel substitution, Oils, Mixtures, Developing countries, ERDA/140504, ERDA/320301, ERDA/299003.

Current US and Latin American interest has focused on replacement and substitution of gasoline by ethyl alcohol. However, extending diesel fuel, which is used in agricultural engines and necessary transport, is the basic concern. Three attractive methods, involving the use of vegetable or tree oils, alcohols, in some cases with water, can be successfully used to extend or replace diesel fuels: (1) fatty acid - alcohol - water microemulsions in diesel fuel, (2) higher-alcohol esters of fatty acids, and (3) direct diesel fuel extension with higher alcohols. All three methods of extending diesel fuel are amenable to an appropriate-technology situation. (ERA citation 08:012041)

DE83004707/GAA PC **A02**/MF **A01**
Minnesota Univ., Rosemount. Rosemount Agricultural Experiment Station.
Alternative-Engine-Fuels Demonstration and Materials Test.
D. Thimsen. 1981, 10p DOE/R5/10316-2, CONF-811221-3
Contract FG02-81R510316
American Society of Agricultural Engineers meeting, Chicago, IL, USA, 15 Dec 1981.

Keywords: *Fuels, *Diesel engines, Agriculture, Fuel substitution, Diesel fuels, Fuel additives, Gasoline, Ethanol, Sunflowers, Fuel economy, Gasohol program, ERDA/330800, ERDA/330101, ERDA/330102.

A portable demonstration was constructed to measure peak power and specific fuel consumption of a gasoline engine burning gasoline and ethanol, and a diesel engine burning No. 2 diesel and sunflower oil. The demonstrations were given at farm field days. Several metals were subjected to wet ethanol fuels to measure corrosion. (ERA citation 08:015326)

DE83004749/GAA PC **A03**/MF **A01**
Oak Ridge Associated Universities, Inc., TN. Manpower Education, Research and Training Div.
Assessment of Benefit-Cost Analysis for Coal-Extraction R and D.
J. G. Baker, and W. Stevenson. Oct 82, 38p ORAU-207
Contract AC05-76OR00033

Keywords: *Mining, *Coal, *Research and development, Research programs, Cost benefit analysis, Technology assessment, Economic analysis, Socio-economic factors, Investment, Decision making, Usa, Government policies, ERDA/012000, ERDA/015000, ERDA/294001, ERDA/290500.

This report has two purposes: (1) to discuss guidelines for applying traditional benefit-cost analysis to coal extraction R and D based on a literature review; and (2) to present a critique of Benefit-Cost Analysis of the Coal Extraction R and D Program, a study by the Mitre Corporation completed in 1976. The guidelines include the strengths, weaknesses, omissions, and limitations of benefit-cost methods as a means to rank coal extraction R and D, including those characteristics that are common to all benefit-cost studies and those that are uniquely related to coal extraction R and D. Suggestions are made for solutions to problems and limitations of the traditional benefit-cost method, and the usefulness of benefit-cost methods as a means of ranking competing coal R and D programs is assessed. (ERA citation 08:011738)

DE83004797/GAA PC **A02**/MF **A01**
Marshaus Berry Farms, Defiance, OH.
Solar-Heated Greenhouse Utilizing Water Reservoir. Final Technical Progress Report. Appropriate-Technology Small-Grants Program.
M. E. Marshaus. 27 Dec 82, 14p DOE/R5/10327-2
Contract FG02-81R510327
Paper copy only, copy does not permit microfiche production.

Keywords: *Greenhouses, *Solar Heating Systems, Design, Horticulture, Performance, Pipes, Sensible Heat Storage, Solar Collectors, Solar Space Heating, Temperature Distribution, Water, ERDA/140901.

The initial goal of our proposed project was to construct and equip a 2000 square foot glass greenhouse which would be in production from early April through November, utilizing only solar energy heating. The project consisted of capturing the excess heat produced by the sun's rays during daylight hours, storing it in a water reservoir, and then releasing and reusing that stored heat energy to maintain a desirable night time temperature and favorable growing environment without the use of fossil fuels. A solar collector made from 500 feet of one inch black plastic water pipe was attached to the lower portion of the southern roof section. Water is pumped through this collecting coil for fifteen minute intervals each daylight hour, and then into a series of 80 fifty-five gallon steel drums painted black and connected one to another. Heat collected during the day is stored in these water filled drums and is then released during night time hours when outside temperatures fall. The steeldrums are positioned in such a way that no floor space is wasted. Racks, made of one inch galvanized pipe were welded and laid directly on top of the steel drum reservoir. The plastic flats filled with seedlings and transplants were then placed on these racks. Not only did this utilize all available growing space, but it placed the plants directly above the warmed water circulated and stored in the reservoir.On April 1, 1982, the first flats of transplanted seedlings were moved into the new house. By May 20, 1982, over 90,000 flower and vegetable plants from seedlings had grown to fully developed transplants. Total fuel costs were approximately $20.00. (ERA citation 08:012157)

DE83004873/GAA PC **A06**/MF **A01**
Mellon Inst., Arlington, VA. Energy Productivity Center.
Maintaining Automotive Mobility: Using Fuel Economy and Synthetic Fuels to Compete with OPEC Oil. Final Report.
R. H. Shackson, and H. J. Leach. 1 Mar 82, 101p
DOE/CS/50108-1
Contract AC02-79CS50108

Keywords: *Fuels, *Automobiles, Fuel economy, Synthetic fuels, Cost, Financing, Sensitivity analysis, Forecasting, ERDA/320203.

Two strategies for reducing the cost and increasing the reliability of the automotive transportation system are the improvement of fuel economy and the production of nonpetroleum fuels. The options are investigated for implementation of these strategies over the next 20 years, and the strategies are compared. The study methodology has three major components: an estimate of the costs of improving automobile and light truck fuel economy, an estimate of the cost of producing synthetic fuels for transportation, and subjecting these estimates to the scrutiny and criticism of a steering group composed of experts in the relevant fields. The methodology and data used to compute new automobile and light truck fuel economy, fleet fuel consumption, capital requirements, and consumer costs, under different scenario assumptions for the years 1980 to 2000 are described. The baseline technology and fleet characteristics are discussed, followed by a description of the automotive technology. The effects of introducing new technologies into the car and truck fleet are examined based on several scenarios, followed by a sensitivity analysis. (ERA citation 08:012612)

DE83005180/GAA PC **A09**/MF **A01**
Oak Ridge National Lab., TN.
On-Farm Use of Biomass Fuels: Market Penetration Potential During Normal and Fuel-Emergency Conditions.
D. J. Bjornstad, E. L. Hillsman, R. C. Tepel, J. B. Mills, and C. V. CHester. Dec 82, 190p ORNL-5894
Contract W-7405-ENG-26

Keywords: *Fuels, *Biomass, Marketing research, *Gasification, Drying, Anaerobic digestion, Ethanol, Butanols, Gasoline, ERDA/140504.

The potential for biomass fuels produced in decentralized facilities to replace the centrally produced fuels currently used in agriculture is examined. Two issues are examined. Will biomass fuels become cost-competitive relative to central fuels. And, what is the potential for biomass fuels to replace central fuels during emergency conditions when central fuels are unavailable. To answer these questions, descriptions of a range of currently available biomass technologies have been prepared and estimates made of current and projected agricultural fuel needs and biomass-feedstock availabilities. A variety of assumptions about future conditions have been adopted, the most important of which is that central fuel prices escalate at 7.5% annually relative to the commodities and inputs used to produce biomass fuel products. Under these assumptions, a number of biomass fuels will become cost-competitive during the 1980s, but most will do so late in the decade. Moreover, once these fuels become cost-competitive, penetration will occur gradually. Market forces thus will not markedly reduce the vulnerability of agriculture to energy-supply interruptions during this period. Biomass fuels could, however, play an important role during a fuel emergency. Estimates indicate they could replace up to about 60% of annual agricultural-sector fuel consumption by 1990, during the course of a fuel emergency of one year's duration. (ERA citation 08:012065)

DE83005260/GAA PC **A08**/MF **A01**
INCELL Corp., Milwaukee, WI.
Development of High Alcohol Tolerant Organisms. I. Strain Selection and Screening. Annual Report, 31 July 1981-1 August 1982.
P. D. Bayne. Dec 82, 162p DOE/ID/12332-T1
Contract FG07-81ID12332

Keywords: *Alcohols, *Ethanol, Mutants, Biological adaptation, Tolerance, Biosynthesis, Fermentation, Genetic engineering, Glucose, Maize, Mutations, ERDA/090222, ERDA/140504, ERDA/550700.

The principal objective of this study is the selection and development of an alcohol tolerant microorganism strain which will allow less water to be removed from the fermented beer, thus allowing the more energy efficient production of fuel alcohol. The program resulted in the selection of an outstanding strain of Zymomonas (B-10) for further evaluation in pilot scale fermentations and development by both mutagenesis and continuous selection. One culture strain of yeast and a number of mutant and variant strains of yeast await further evaluation for possible use as high alcohol tolerant strains in the production of power alcohol. Most important of all, the results of this investigation suggest a genetic basis, not a biochemical one, for strain differences in alcohol tolerance. It is our belief that a rational program of mass mutagenesis and screening will afford superior strains just as in the development of antibiotic yields. The automation and standardization of these mutagenic and selective regimes will allow larger samples to be screened and detect tolerance differences with greater sensitivity. Elimination of carbon diversion and increasing ethanol production rates and yields appear to be possible from the preliminary work conducted. Where several natural lines yield more tolerant strains by these procedures, genetic crossing, possibly using in vitro genetic chemical methods to circumvent natural barrier mechanisms, such as polyploidy, could result in derivatives with even greater tolerance. (ERA citation 08:011973)

DE83005367/GAA PC **A03**/MF **A01**
ESG, Inc., Atlanta, GA.
Field Research Tasks and Technical Services. Project Status Report, September 1-November 30, 1982.
Dec 82, 27p DOE/CH/10122-10
Contract AC02-82CH10122
Portions are illegible in microfiche products.

Keywords: *Solar water heating, *Biomass, Residential buildings, Program management, Industrial plants, Commercial buildings, ERDA/320100, ERDA/140504, ERDA/140907, ERDA/299000.

Progress is reported in two primary areas, field measurement, analyses, and reporting related to building energy systems and biomass projects; and technical services in support of appropriate technology program. Major efforts during this reporting period were devoted to performance monitoring specifically in support of DOE's Class B program. Virtually all test sites were visited during the period at which time instrumentation was checked out and software updated. Work continued on the data regression analysis effort. Other key efforts during the period included completion of the SLR-Plus computer program user manual and the near completion of a guide for commercial water heating applications. A meeting was held with the Chicago Operations Program Manager and numerous project matters were defined and resolved. This included the approach to final documentation of Appropriate Technology Project Reports. In addition, a strategy was developed for conducting site visits of on-going projects. (ERA citation 08:015206)

DE83005646/GAA PC **A02**/MF **A01**
Illinois Inst. of Tech., Chicago.
Diffusion Mechanisms and Degradation of Environmentally Sensitive Composite Materials. July 1, 1977 - June 30, 1982. Final Report.
L. J. Broutman. Jan 83, 7p DOE/ER/04440-T1, COO-4440-10
Contract AC02-77ER04440

Keywords: *Research and development, Research programs, Epoxides, Resins, Moisture, Diffusion, Fibers, Stresses, ERDA/360305.

This final report summarizes by outline the significant discoveries with respect to moisture diffusion and degradation of epoxy resins and epoxy composites. Significant discoveries have been made concerning moisture diffusion in epoxy resins and anomalies previously cited in the literature have been explained. Further, the role of the interface and matrix in fiber-reinforced composites with respect to moisture diffusion have been clarified and the effect of stress during diffusion has also been studied. (ERA citation 08:018290)

DE83005652/GAA PC **A02**/MF **A01**
Atomics International Div., Golden, CO. Rocky Flats Plant.
Catalysts for Removal of Nitrogen Oxides.
T. Kodera, M. Kozasa, and T. Takano. Jan 83, 6p
RFP-Trans-356
Contract AC04-76DP03533
Translation of Japanese Kokai Patent Publication No. Sho 52-14592, 1977.

Keywords: *Chemical industry, Removal, Chemical preparation, Catalyst supports, Catalytic effects, ERDA/010800, ERDA/424000, ERDA/400201, ERDA/200202, Translations.

A catalyst is claimed for removing nitrogen oxides from waste gases discharged from electric power plants and chemical plants. The catalyst is a Mn-containing spinel-type ferrite which is bonded and solidified with a mixture of calcium aluminate or alumina and calcium oxide. Since the calcium aluminate support readily adsorbs sulfur dioxide, catalyst poisoning by sulfur dioxide is minimized, and catalytic activity can be maintained for a long period of time. Moreover, the catalyst can be produced without difficulty and is inexpensive. (ERA citation 08:013753)

DE83005670/GAA PC **A02**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Materials Engineering.
VPI-4.8 - Investigation of Carbon Monoxide Disintegration of Refractories in Coal Gasifiers.
R. Morena, L. Slusser, and J. J. Brown, Jr. 1982, 6p
DOE/ET/13702-T1
Contract AC05-80ET13702

Keywords: *Coal, *Gasification, *Industrial plants, Coal gasification, Corrosion, Corrosive effects, Temperature dependence, Iron compounds, Corrosion resistance, Experimental data, Compression strength, Chemical composition, ERDA/010404, ERDA/360205.

Refractories used in coal gasification vessels and piping are exposed to mixtures of hydrogen, steam, hydrogen sulfide, methane, carbon monoxide, and other gases over a wide range of tempertures and pressures. Many refractories are known to deteriorate when exposed for long periods of time to CO-containing atmospheres, especially if the temperature is below about 1300 exp 0 F and if the refractory contains any iron containing compounds. It is, therefore, important to develop experience and engineering data on these refractories under simulated coal gasifying conditions and to attempt to determine the effect of each identifiable variable on the CO resistance of the refractories used in coal gasifiers. The objectives of this investigation are (1) to determine whether or not CO disintegration is likely to occur in the refractories used in coal gasifiers, and (2) identify the conditions under which CO disintegration of the refractories can be expected to be a serious problem. It is also a goal of this investigation to develop information that will assist in the identification of refractory deterioration or failure that is caused by CO disintegration. Results of exposure in a flow-through test vessel (500 exp 0 C, 1000 psig, 50 h) are given for several costable refractories. The gases involved were CO and simulated gasification atmospheres. (ERA citation 08:019429)

DE83005805/GAA PC **A03**/MF **A01**
Brookhaven National Lab., Upton, NY.
Analytic Tools for Techno-Economic Assessments of Industrial Energy Efficiency in Developing Countries.
G. Anandalingam, and D. J. Jhirad. 1982, 47p BNL-32251, CONF-8208110-1
Contract AC02-76CH00016
International conference on technological and industrial cooperation in the utilization of renewable energy resources, West Berlin, F.R. Germany, 16 Aug 1982.
Portions are illegible in microfiche products.

Keywords: *Energy conservation, *Industrial plants, Energy efficiency, Technology utilization, *Technology assessment, Economic impact, Decision making, Institutional factors, Economic analysis, Legal incentives, ERDA/290200, ERDA/293000, ERDA/290100.

This paper discusses the opportunities and problems associated with using energy-efficient technologies in the developing countries, and in developing analytical tools to aid energy policy-makers and planners in decision making at the project, sector, and national level. This paper focuses on the following topics: industrial energy consumption patterns in developing countries; engineering efficiency and case studies, government policy instruments to encourage the implementation of cost-effective energy efficient technologies and measures; and analytic tools to assist planners in designing incentives and in making decisions regarding capital investment and technology deployment in the short, medium, and long-term future. (ERA citation 08:017997)

DE83005997/GAA PC **A05**/MF **A01**
Brookhaven National Lab., Upton, NY.
Organic Air Pollutants: Setting Priorities for Long Term Research Needs. A Workshop Sponsored by the United States Department of Energy, April 19-23, 1982, Gettysburg, PA.
J. S. Gaffney. Apr 82, 79p BNL-51605
Contract AC02-76CH00016

Keywords: *Air pollution, Air pollution control, Chemical properties, Physical properties, Chemical reaction kinetics, Air quality, Mathematical models, Recommendations, Research programs, Reviews, ERDA/500200, ERDA/560300.

The workshop attempted to outline and prioritize current and future research dealing with the environmental and biomedical concern of organic air pollutants. The meeting addressed the following four main areas of research: chemical and physical characterization of source emissions and ambient levels of organic pollutants; atmospheric chemical and physical transformations (homogeneous and heterogeneous) of organic pollutants; biochemical testing procedures to determine potential biological and human health impacts; and air quality - dispersion simulation and source/receptor modeling as tools in assessing potential biomedical and geophysical impacts of organic air pollutants. Details of each discussion group's deliberations and recommendations are summarized. (ERA citation 08:016029)

DE83006499/GAA PC **A06**/MF **A01**
Department of Energy, Washington, DC. Office of Coal, Nuclear, Electric and Alternate Fuels.
Impacts of Financial Constraints on the Electric Utility Industry.
B. O'Brien. Dec 81, 103p DOE/EIA-0311

Keywords: *Financial management, *Electric power, Usa, Financing, Forecasting, Economics, Capacity, Power generation, Planning, Rate structure, Electric power, ERDA/296000.

This report projects the effects that protracted financial constraints on the electric utility industry would have in the next 15 years, considering five key variables: electricity demand; reserve margins; fuel use; electricity rates to consumers; and capital expenditures. Projections are reported for each of these 5 variables under two conditions: the Base Case in which utilities are able to obtain financing for all the new construction currently planned and for any additional power plants justified by economics; and the Financially Constrained Case in which utilities are unable to obtain financing for many new projects, and are able to build only those facilities for which they already have a major financial commitment, assuming that those facilities can be financed to completion. Among the important findings are the following: is given national electricity demand growth projections of about 3.2 % annually through 1995, many coal-fired and nuclear power plants could be delayed from the Base Case, however, additional combustion turbines would have to be installed to assure regional and national reliability, or a national reserve margin of 23%. Under these conditions of demand growth, the construction delays envisioned for the constrained case would require utility consumption of oil and gas to remain approximately at current levels; electricity prices in the Constrained case would increase about 24% regionally and nearly 8% nationally as compared with the Base case. It is concluded that, for both cases, consumer demand to 1995 can be met if combustion turbines are built to meet peak demand, and continued financial pressure on the utility industry will not allow optimal generation capacity expansion and will have serious adverse effects on the industry. (ERA citation 08:015157)

DE83006585/GAA PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Livestock Waste Treatment System.
K. Nakajima. 1982, 11p ORNL-tr-4948
Contract W-7405-ENG-26
Translation of Japanese published Patent Application 1982-9880.

Keywords: *Manures, *Waste recycling, Waste processing, Drying, Anaerobic digestion, Design, Agriculture, ERDA/140504, ERDA/090122, ERDA/320303, Translations, Patents.

The present livestock waste treatment system is characterized by the fact that it consists of two separate sections: a fermentation section which ferments livestock wastes and is equipped with a conveyor system, and secondly a drying section which dries the fermented livestock wastes brought in by the convenient conveyor system from the fermentation section. The present livestock waste treatment system is also characterized by the fact that it is equipped with a radiant heat system in the drying section, which transmits and radiates part of the heat generated by fermentation in the above mentioned fermentation section. (ERA citation 08:017618)

DE83006648/GAA PC **A02**/MF **A01**
Atomics International Div., Golden, CO. Rocky Flats Plant.
Process for Producing Oxygen.
T. Furukawa. Feb 83, 5p RFP-Trans-358
Contract AC04-76DP03533
Translation of Japanese Patent Publication No. Sho 53-29312, 1978.

Keywords: *Oxygen, *Chemical industry, *Nitrogen, Adsorption, Air, Separation processes, Ferrite, Sorptive properties, ERDA/400105, ERDA/400201, Translations.

This invention concerns a process for efficiently collecting oxygen from the air. According to the findings of the inventor, if air is brought into contact with natural zeolite whose moisture content has been reduced to lower than 1% by calcination, together with additional anisotropic ferrite magnet, nitrogen is efficiently and selectively adsorbed on the natural zeolite while oxygen is attracted to the anisotropic ferrite magnet and prevented from being adsorbed on the zeolite. Oxygen at a concentration of 88% can be obtained. 2 figures. (ERA citation 08:018326)

DE83006747/GAA PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Erosion of Hard-Metal Coatings.
A. Levy, T. Bakker, E. Sholz, and M. Azadabeh. Oct 82, 42p LBL-15293, CONF-830317-1
Contract AC03-76SF00098
TMS/AIME meeting, Atlanta, GA, USA, 6 Mar 1983.

Keywords: *Metals, *Nickel, Protective coatings, Erosion, Experimental data, ERDA/360205.

The use of protective coatings on components in fossil-fuel energy processes to provide thermal insulation, corrosion resistance and/or wear resistance is becoming more prevalent. In those applications where small, erosive particles occur in the environment, such as in the use of pulverized coal, erosion behavior of the coating becomes an important design consideration. The erosion of several protective, hard-metal-type coatings and monolithic inserts by particles entrained in an air blast has been investigatd. SiC, Si sub 3 N sub 4 , tungsten carbide, and a series of nickel-chromium-boron alloys were tested at room temperature. The materials were fabricated by chemical vapor deposition, flame spraying, plasma-arc spraying, detonation-gun spraying, melting and brazing, and hot pressing. The effects of composition, morphology, method of facrbrication, thickness, and surface texture on erosion behavior are discussed. The mechanisms of erosion for the different materials are defined and compared. It was determined that the materials had a wide range of erosion resistance with the fine-grain-size and minimum-porosity materials having the lowest erosion rates. All of the materials tested eroded in a brittle manner with essentially no relationship to hardness. 19 figures. (ERA citation 08:021126)

DE83006955/GAA PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Solar-Energy Program, FY 1981. Chapter from the Energy and Environment Division Annual Report.
Sep 82, 34p LBL-13496
Contract AC03-76SF00098
Portions are illegible in microfiche products.

Keywords: *Solar cooling systems, *Solar heating systems, *Solar energy, Research programs, Proteins, Energy conversion, ERDA/140900, ERDA/141000, ERDA/140100, ERDA/140700.

Separate abstracts were prepared for nine project progress reports. (ERA citation 08:017662)

DE83007032/GAA PC **A03**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Relationships Between the Sol-to-Gel and Gel-to-Glass Conversions.
C. J. Brinker, and G. W. Scherer. 1983, 32p SAND-83-1098C, CONF-830215-1
International conference on ultrastructure processing of ceramics, glasses and composites, Gainesville, FL, USA, 14 Feb 1983.

Keywords: *Glass, Gels, Sols, Sol-gel process, Ph value, Water, Production, Conversion, Physical properties, Shrinkage, ERDA/360601.

Multicomponent gels were prepared with a wide range of pH- water combinations so that the skeletal structure of the desiccated gels varied from being less highly (low pH, low H sub 2 O) to more highly (high pH, high H sub 2 O) polymerized. The apparent value of isothermal viscosity, determined by isothermal shrinkage experiments, was found to increase with time, presumably due to polymerization and structural relaxation of the skeletal framework. This increase was dramatic (>200X) for less highly polymerized gels but was found to occur in all cases, and it therefore is predicted to be a general property of metal alkoxide derived gels. (ERA citation 08:021168)

DE83007165/GAA PC **A05**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Methods for Evaluating the DOE Appropriate-Technology Program: A Review and Compilation of Evaluation Methods.
B. Lucarelli. Jul 82, 92p LBL-14782-Rev.
Contract AC03-76SF00098
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Keywords: *Project evaluation, *Renewable energy, Program management, Evaluation, Wind power, Hydroelectric power, Biomass, Solar water heating, Solar space heating, Passive solar heating systems, Weatherization, Energy conservation, Geothermal space heating, Geothermal water heating, Load collector ratio, Solar fraction, ERDA/299000.

Procedures are described for evaluating the energy impact of renewable energy resource projects. Four recommendations are made: to establish a common set of guidelines for evaluating the energy impact of federal energy grant programs; use a simplified evaluation approach in the interim until the guidelines are set; develop additional project evaluation methods; and analyze the non-energy impacts of the Appropriate Technology Program. Previously used evaluation approaches are discussed as regards energy impact definition, sample selection, project evaluation, and program impact analysis. Methods are described for determining direct energy impacts of: wind electric, hydroelectric, anaerobic digestion (biomass); solar water heating and space heating; passive solar; weatherization/conservation; and geothermal space and water heating technologies. The methodology for estimating the cost-effectiveness of an energy system is presented. Tables of load collector ratios and solar savings fraction for different passive systems are supplied. (ERA citation 08:020865)

DE83007218/GAA PC **A03**/MF **A01**
Lawrence Livermore National Lab., CA.
Potential of Composite Materials in Surface Transportation Applications.
S. V. Kulkarni. 16 Dec 82, 49p UCRL-53351
Contract W-7405-ENG-48

Keywords: *Automobiles, Uses, Materials, Weight, Fibers, Graphite, ERDA/360300, ERDA/330604.

This study addresses the different issues associated with materials substitution with fiber-reinforced composites in surface transportation vehicles, and identifies pertinent high risk R and D areas having payoff in the far term. Initially, a brief summary of the various materials and processes, and prototype development programs is presented. Subsequently, factors inhibiting the use of composites are listed and finally, future R and D areas are delineated. No attempt has been made to perform an exhaustive study and cover every aspect and activity in this technology area. This is due primarily to the limited scope of this effort and to the vastness of the field. (ERA citation 08:018293)

DE83007385/GAA PC **A09**/MF **A01**
New York State Coll. of Agriculture and Life Sciences, Ithaca. Dept. of Agricultural Engineering.
Feasibility of Biogas Production on Farms.
W. J. Jewell, B. A. Adams, B. P. Eckstrom, K. J. Fanfoni, and R. M. Kabrick. Jan 82, 178p SERI/PR-9038-1-T1
Contracts AC02-77CH00178, AC02-76ET20051
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Keywords: *Methane, *Biogas, Production, Economics, Safety, Recommendations, Regulations, Supply and demand, *Technology assessment, ERDA/140504, ERDA/299003, ERDA/090222.

An overview of biogas technology is presented. The following topics are discussed: the potentials and limitations of anaerobic digestion; on-site energy generation: relationship of demand to supply; economics of farm-scale biogas production; design considerations of the biogas production system; gas utilization; safety guidelines and regulations; and operation, maintenance, and diagnostics of small methane generation systems. (ERA citation 08:020021)

DE83007542/GAA PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Nonlinear Seismic Response of Small Reinforced-Concrete Shear Wall Structures.
E. G. Endebrock, and R. C. Dove. 1983, 11p LA-UR-83-318, CONF-830805-3
Contract W-7405-ENG-36
International conference on structural mechanics in reactor technology, Chicago, IL, USA, 22 Aug 1983.
Portions are illegible in microfiche products.

Keywords: *Reinforced Concrete, Materials Testing, Dynamic Loads, Mechanical Vibrations, ERDA/420500.

The paper describes dynamic tests on small shear wall structures. The purpose of the tests was to obtain information on the behavior of reinforced concrete structures loaded into their nonlinear range. The small shear wall structures were subjected to classical sine-sweep vibration tests and to generated earthquake records. The results indicate that sine-sweep tests on degrading structures do not yield useful results because of fatigue effects and because steady-state motions cannot be achieved; however, the earthquake tests did yield useful information. From the earthquake tests results, responses were obtained that were plotted on computed linear and nonlinear non-dimensionalized response spectra. For loading within the linear range, the data indicate that the equivalent viscous damping for the test structures is about 12.5%. The test results also indicate that, in general, manipulation of the viscous damping coefficient cannot be used to predict nonlinear behavior. The more significant observation was that the effective stiffness of the shear wall structures, as determined from the dynamic tests, was only about 1/5 to 1/7 of the stiffness calculated using standard calculation methods. (ERA citation 08:041947)

DE83007739/GAA MF **A01**
Argonne National Lab., IL.
Argonne Energy Model - Portugal.
F. R. Wyant, and C. M. Macal. 4 Apr 81, 81p DOE/NBM-3007739
Contract W-31-109-ENG-38
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Keywords: *Portugal, *South Korea, *Energy management, Government policies, Cost benefit analysis, Energy models, Developing countries, Economic impact, Economic development, Energy conservation, ERDA/290100, ERDA/290200.

The Argonne Energy Models (AEMS) for Portugal and Korea were constructed to analyze the economic impacts of various conditions and policies that could alter the energy-sector outlook in Portugal and Korea. Some preliminary conclusions from this energy-modeling exercise for Portugal are presented. Individual sections provide a brief description of the model methodology; a discussion of key data inputs to the model; an analysis of reference case results, a comparison of other economic growth, energy price, and government policy cases; and a summary. (ERA citation 08:023692)

DE83008178/GAA PC **A06**/MF **A01**
Cornell Univ., Ithaca, NY.
Energetic and Environmental Aspects of Utilizing Crop and Forest Residues for Biomass Energy. Final Report.
D. Pimentel, S. Fast, D. Gallahan, and M. A. Moran. Feb 83, 119p DOE/ER/60002-1
Contract AC02-81ER60002
Portions are illegible in microfiche products.

Keywords: *Wood wastes, *Agricultural wastes, Resource potential, *Biomass, Yields, Harvesting, Land use, Availability, Nutrients, Terrestrial ecosystems, Erosion, Combustion, Ethanol, ERDA/140504, ERDA/299003.

Crop and forest residues are essential to protect the soil from erosion and rapid water runoff and to maintain soil organic matter and nutrients. Only an estimated 20% of the total residues remaining after harvest can be utilized for conversion because of environmental limitations and the impracticality of harvesting residues on some lands. The residues available for biomass energy could produce a maximum amount of gross energy equal to either 232 million barrels of high-grade liquid fuel (about 6% of current US oil consumption), 5% of the electrical energy, or 1.5% of total US energy if residues were used as heat (steam). The net yields of energy from the residues, however, would range from only 10 to 50% of the gross because of the large energy inputs for harvesting, hauling, nutrient replacement, and processing. Although these potential contributions to US energy needs are relatively small, it is renewable energy (assuming no environmental degradation) and therefore has some long-term value to the nation's energy program. (ERA citation 08:019987)

DE83008249/GAA PC **A06**/MF **A01**
Iowa Univ., Iowa City. Div. of Energy Engineering.
Vacuum Distillation of Fuel Alcohol Using Solar Energy. Final Report.
M. L. Holden, and T. F. Smith. 30 Nov 82, 117p DOE/ID/12341-T1
Contract FG07-81ID12341

Keywords: *Alcohols, *Solar energy, *Fuels, *Ethanol, Solar distillation, Pilot plants, Control systems, Data acquisition systems, Flow rate, Construction, Operation, Calibration, Solar collectors, Thermal energy storage equipment, Vacuum distillation, ERDA/140909, ERDA/140504, ERDA/090222.

Solar assisted distillation of ethanol fuel is examined by building, calibrating, and operating a pilot plant. First, the pilot plant was desingned and built with the components of solar collector, thermal energy storage tank, distillation unit, and data acquisition and control systems. Next, the instruments and control loops were calibrated to ensure accurate and repeatable measurements. Finally, experiments using solar energy and electric energy determined technical performance and feasibility of solar assisted distillation. Experiments determined representative temperatures, pressures, flow rates, and product composition. Comparison of solar and electric energy experiments determined the effect of solar energy varying over the period of one day and effects due to passing clouds. Experimental results indicate solar assisted distillation of ethanol fuel is technically feasible. (ERA citation 08:020088)

DE83008728/GAA PC **A02**/MF **A01**
Department of Energy, Oak Ridge, TN. Technical Information Center.
Information for Technology Innovation. Summary Paper.
C. E. Stuber. 20 Jan 81, 14p DOE/TIC-3008728

Keywords: *Technology transfer, *Information sources, Reviews, Research programs, Inventions, Productivity, Management, ERDA/990300, ERDA/290500.

Research and development are integral parts of the innovation process, but they make no economic contribution unless the knowledge generated is integrated into the production process or manifested in a new or improved product that is sold on the market. Successful innovation depends in a large part on the effective integration of market and technical information by the innovating organization. Various Congressional and Executive actions have been taken in the last few years to enhance technology transfer and information transfer to assist in the process. The DOE Technical Information Center has the following ongoing programs to promote innovation through increased information availability: (1) a technology-transfer program to announce information, devices, or processes with potential application in industry; (2) bilateral and multilateral information-exchange agreements to acquisition the international energy-related information; (3) a computerized Technical Information Management System to ensure proper and timely reporting of DOE-sponsored R and D information; (4) a computerized Research in Progress retrieval system containing information about DOE ongoing research projects; (5) a computerized Energy Data Base retrieval system containing information on all foreign and domestic energy-related R and D; and (6) a series of publications to announce all energy-related R and D information. Also the Office of Energy Research, DOE Headquarters, is coordinating the technology transfer program of the DOE Federal Laboratories. (ERA citation 08:025284)

DE83009591/GAA PC **A02**/MF **A01**
Argonne National Lab., IL.
Fine Particles and Precipitation: Some Case Studies.
S. A. Johnson, D. L. Sisterson, and R. Kumar. 1983, 5p CONF-830438-1
Contract W-31-109-ENG-38
American Association for Aerosol Research annual meeting, College Park, MD, USA, 18 Apr 1983.

Keywords: *Aerosols, Aerosol Monitoring, Particle Size, Atmospheric Precipitations, Ammonium Sulfates, Chemical Composition, Precipitation Scavenging, Advection, Absorption Spectroscopy, ERDA/500200.

The chemical composition and mass loading of atmospheric fine-particle aerosols were examined, before, during, and after 25 individual precipitation events during a 12-month period. The sub-micrometer (0.3 to 1.0 mu m) aerosol particles were collected using a modified Lundgren cascade impactor, and analyzed using Fourier-transform infrared absorption spectroscopy. In several cases where the precipitation was not accompanied by a frontal passage or other means of air mass change, two types of fine-particle aerosol behavior were observed. In one, the concentration of aerosol particles was reduced during the rain, but the concentration recovered quickly after the event. In the other, the aerosol particle concentrations increased during or after the rain, so that the precipitation event was an apparent source of particles in the 0.3 to 1.0 mu m size range. The chemical composition of the aerosol particles was also affected by the precipitation, leading to changes in the ammonium sulfate content of the aerosols, which changes were not always similar to the changes in the particles' mass loading. The meteorology associated with each precipitation event was examined in detail to determine the factors responsible for the observed behavior of the aerosol particles. The first type of behavior, a decrease in aerosol mass loading during the precipitation but recovery afterwards, is illustrated. The decrease could be attributed to the precipitation scavenging the particles locally; the subsequent recovery was caused by advection of other portions of the same air mass to the sampling location. The second type of behavior, an increase in the particle concentrations during or after the precipitation, is shown. An example of a decrease in ammonium sulfate in the particles simultaneous with an increase in the particle mass loading is shown. (ERA citation 08:030333)

DE83009665/GAA PC **A03**/MF **A01**
Merix Corp., Babson Park, MA.
Low-Energy Route for Alcohol/Gasohol Recovery from Fermentor Beer. Final Report.
T. W. Mix. Mar 82, 40p DOE/ID/12321-T1
Contract FG07-81ID12321

Keywords: *Ethanol, *Alcohols, *Gasohol, Solvent Extraction, Fermentation, Solvent Properties, Distillation, Distillation Equipment, ERDA/140504, ERDA/090222.

The production of gasohol directly from fermentor beer and gasoline is feasible and will enable a major reduction in the energy requirements for gasohol production. The fermentor beer is first enriched in a beer still to a 69 mol % ethanol, 31 mol % water product which is then dehydrated by extractive distillation with gasoline as the extractive agent. Gasohol is produced directly. In one version of the process, a heavy cut of gasoline, presumed available at a refinery before blending in of light components, is used as the extractive agent. The enriching column overhead vapors are used to reboil the extractive distillation and steam stripping columns and to contribute to the preheating of the fermentor beer feed. Light components are blended into the heavy cut-ethanol bottom product from the extractive distillation column to form the desired gasohol. Energy requirements, including feed preheat, are 11,000 Btu per gallon of ethanol in the product gasohol. One hundred and fifty pound steam is required. In a second version, full range gasoline is used as the extractive agent. The enriching column overhead vapors are again used to reboil the extractive distillation and steam stripping columns and to contribute to the preheating of the fermentor beer feed. Light gasoline components recovered from the decanter following the overhead condenser of the extractive distillation column are blended in with the gasoline-ethanol product leaving the bottom of the extractive distillation column to form the desired gasohol. Energy requirements in this case are 13,000 Btu/gallon of ethanol in the product gasohol. In both of the above cases it is energy-conservative and desirable from a process standpoint to feed the enriched alcohol to the extractive distillation column as a liquid rather than as a vapor. (ERA citation 08:025845)

DE83009725/GAA PC **A04**/MF **A01**
Bend Research, Inc., OR.
Countercurrent Reverse Osmosis for Ethanol-Water Separation. Final Report, August 7, 1981-November 6, 1982.
E. K. L. Lee, W. C. Babcock, and P. A. Bresnahan.
Mar 83, 66p DOE/ID/12320-T1
Contract FG07-81ID12320

Keywords: *Ethanol, Osmosis, Separation Processes, Membranes, Water, ERDA/140504, ERDA/090222.

The objective of this program was to investigate the technical and economic feasibility of producing concentrated ethanol from dilute feedstocks using a membrane process called countercurrent reverse osmosis (CCRO). A number of commerical membranes prepared in our laboratory for their suitability for CCRO application were evaluated. Included were some of the best RO membranes currently available for desalination. In all cases the membranes exhibited decreasing ethanol-water selectivities with increasing ethanol concentration in the feed stream, becoming essentially non-selective toward a 50- to 60-vol % ethanol feed. Thus, it appears that even with state-of-the-art membranes, concentration of ethanol above 50 vol % is not possible. It was also observed various degrees of degradation among the membranes. To test the feasibility of using CCRO to reduce osmotic pressure across the membranes, experiments were performed in which ethanol solutions were introduced on the permeate side of the membrane. In only one membrane (developed at Bend Research and designated 3N8) was a large effect observed. the results obtained with 3N8 membranes were used as the basis for projecting the performance of the CCRO process. An economic analysis of CCRO was conducted, including a comparison of the economics of CCRO with distillation. The results of this analysis suggest that CCRO is more energy-efficient than distillation for a given product concentration and output rate, but that it involves higher capital equipment costs. (ERA citation 08:025844)

DE83010221/GAA PC **A04**/MF **A01**
ESG, Inc., Atlanta, GA.
Project Status Report on Field Research Tasks and Technical Services, December 1, 1982-February 28, 1983.
Mar 83, 69p DOE/CH/10122-13
Contract AC02-82CH10122
Portions are illegible in microfiche products.

Keywords: *Solar water heating, *Research and development, *Solar heating systems, *Buildings, Residential Buildings, Design, Performance Testing, Commercial Buildings, Industrial Plants, Computerized Simulation, Biomass Conversion Plants, Technology Transfer, Surveys, ERDA/140901, ERDA/140907, ERDA/140504.

Relative to Field Measurement, Analyses, and Reporting Related to Building Energy Systems and Biomass Projects, sound progress continued on monitoring of 8 priority Class B sites. Attention is being given to initial data analysis, including basic comparison with other field work. Site documentation is being developed while working with the day-to-day instrumentation upgrades and data collection tasks. Major work has been completed on the SLR-Plus analysis tool, including near completion of the algorithm reference manual. Work is continuing on improved techniques for handling mass walls with particular attention to cooling load interactions. Analysis of performance results of domestic hot water monitoring program results and major reporting tasks are covered. Technology transfer efforts for industry and other special applications was continued to the extent feasible. This work was at a relatively low level of effort. Good progress is being made on Technical Services in Support of Appropriate Technology Program. Twenty-nine additional project files were received at ESG, bringing the total for review to 85. A large percentage of the initial review work has been completed. Seven selected site visits were made, and appropriate telephone monitoring continued. A presentation on project activities was made for a meeting involving state energy office personnel in the region involved. (ERA citation 08:029411)

DE83010824/GAA PC **A03**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Fracture-Toughness Testing of Ductile Cast Irons.
R. Salzbrenner, J. A. VanDenAvyle, and T. J. Lutz.
1983, 37p SAND-83-0029C, CONF-830820-1
Contract AC04-76DP00789
16. national symposium on fracture mechanics, Columbus, OH, USA, 15 Aug 1983.

Keywords: *Metals, Fracture Properties, Temperature Dependence, Experimental Data, ERDA/360103.

The fracture toughness of ferritic, spheroidal graphite ductile cast iron has been measured by a single specimen J-integral technique. Two ductile cast irons were investigated; they had similar volume fractions of graphite, graphite nodule sizes, and ferrite grain sizes. One, however, contained approximately 15% pearlite, while the other had less than 1% pearlite. The alloy with greater pearlite content exhibited higher strength and higher ductile-to-brittle transition temperature. Although cast irons are generally perceived as being low in toughness, the toughness values measured on fully ferritic nodular iron were quite high (K/sub IC/ = 80 to 106 MPa sqrt m or 73 to 96 ksi sqrt in from -80 to 25 exp 0 C). (ERA citation 08:041577)

DE83011403/GAA PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Resources, Recycle, and Substitution.
R. G. Wymer. 1982, 33p DOE/NBM-3011403
Contract W-7405-ENG-26
Portions are illegible in microfiche products.

Keywords: *Metals, *Minerals, *Natural resources, Resource Conservation, Developed Countries, Developing Countries, Recycling, Raw Materials, Reserves, ERDA/290400, ERDA/360100.

A two-fold strategy appears necessary to ensure that the resource needs of the developed and developing nations are met. First, recycle and substitution must be encouraged in those instances where they do find application. Although these measures have limited applicability, they may be of vital importance in those instances where they do apply; in any event, they buy time. Second, practical and economical technologies must be developed to exploit the lower-grade and marginal ores and the oftentimes abundant but highly refractory ores, as well as to greatly increase the recovery of secondary elements present in the ores - elements whose form and amounts in the ores make them economically unrecoverable by themselves, but which are economically recoverable as by-products. It is often the case that if these elements are not recovered during the initial mining and milling operations, they are rendered unrecoverable, in a practical sense, forever. Furthermore, they may even become environmental pollutants. Specific examples of recovery from refractory ores, by-product recovery, and recycle are given. Also, some suggestions of substitutes for important resources are tabulated. (ERA citation 08:031829)

DE83011432/GAA PC **A06**/MF **A01**
Understanding Cost Growth and Performance Shortfalls in Pioneer Process Plants,
E. W. Merrow, K. E. Phillips, and C. W. Myers. 1981,
113p RAND/R-2569-DOE
Contract AC01-79PE

Keywords: Synthetic fuels industry, *Industrial plants, *Fuels, *Chemical industry, Chemical plants, Demonstration plants, Commercialization, Forecasting, Performance, Energy source development, Energy policy, Synthetic fuels industry.

Misestimation of the capital costs and performance of innovative energy process plants and other chemical process facilities creates fundamental problems for government and industry in planning the development and commercialization of such plants. What factors are responsible for inaccurate cost estimates for process plants. How well do pioneer plants perform and what factors are responsible for poor plant performance. What are the implications of the answers to the above questions for planning by the process industries and DOE. Thirty-four firms in the process industries provided data. Detailed proprietary information on 44 process plants sustained the analysis. Most of the variation found in cost-estimation error can be explained by the extent to which the plant's technology departs from that of prior plants, the degree of definition of the project's site and related characteristics, and the complexity of the plant. Most of the variation in plant performance is explained by the solid materials. The routinely high performance assumed for pioneer process plants is unrealistic. Over fifty percent of the plants in the sample failed to achieve their production goals in the second six months after start up.

DE83012737/GAA PC **A02**/MF **A01**
Department of Energy, Washington, DC. Office of Industrial Programs.
Energy Conservation and Cost Benefits in the Meat and Poultry Processing Industry.
1983, 24p DOE/TIC-11375
Contract AC06-76RL01830

Keywords: *Poultry, Fowl, *Energy Conservation, *Food Processing, Heat Recovery, Heat Exchangers, Electric Motors, Modifications, Drying, ERDA/320303, ERDA/320304, ERDA/298000, ERDA/291000.

Many processes can benefit from the use of heat exchangers for recovery of waste heat, efficient electric motors, and insulation. Modifications such as combustion air control for boilers and efficient compressors for refrigeration systems are also beneficial and widely applicable. Processes unique to the industry can also be modified to save energy. These modifications typically are capital intensive and often have adjunct product income in addition to energy savings that make them economically attractive. Examples of industry-specific technologies include hog skinning, continuous coagulation and drying of whole blood, and electrical stimulation and hot boning of beef. (ERA citation 08:041433)

DE83014336/GAA PC **A02**/MF **A01**
Argonne National Lab., IL.
Modeling Energy-Sector Issues of Developing and Industrializing Countries.
C. M. Macal, and R. R. Cirillo. 1983, 24p CONF-8304106-1
Contract W-31-109-ENG-38
Joint national meeting of the Operations Research Society of America and the Institute for Management Science, Chicago, IL, USA, 25 Apr 1983.

Keywords: *Energy, *Energy source development, Energy Models, Planning, Government Policies, Pricing Regulations, Accounting, Simulation, Optimization, Equilibrium, ERDA/290100.

This paper identifies important energy-planning issues in industrializing and developing countries based on the Argonne experience in energy-planning studies for Egypt, Korea, Portugal, Argentina, and Jamaica. Modeling approaches are reviewed for applicability to these issues. (ERA citation 08:046510)

DE83014425/GAA PC **A04**/MF **A01**
Lindsey Industries, Inc., Azusa, CA.
Design and Fabrication of Polymer-Concrete Pipe for Testing in Geothermal-Energy Processes. Final Report.
J. E. Schroeder. Jul 81, 68p BNL-33130
Contract AC02-76CH00016

Keywords: *Geothermal energy, *Pipes, Design, Fabrication, Testing, Brines, Mechanical Properties, Service Life, Geothermal Fluids, ERDA/150903.

Polymer concrete is a composite material which has strength and durability characteristics greatly superior to those of portland cement concrete and better durability in hot brine than steel. Polymer concrete has been successfully tested in brine, flashing brine, and steam at temperatures up to 260 exp 0 C (500 exp 0 F). Exposures were as long as 960 days. Glass-filament-wound polymer concrete pipe was developed with excellent strength, low weight, and a cost comparable to or less than Schedule 40 steel. Connections can be made with slip joints for low-pressure applications and flanged joints for high-pressure applications. (ERA citation 08:040566)

DE83015398/GAA PC **A03**/MF **A01**
National Center for Appropriate Technology, Butte, MT.
Wastes to Resources: Appropriate Technologies for Sewage Treatment and Conversion.
S. P. Anderson. Jul 83, 30p DOE/CE/15095-2
Contract AC01-82CE15095

Keywords: *Sewage treatment, *Waste recycling, Waste Processing, *Waste Management, Waste Water, Water Pollution, Ground Disposal, Appropriate Technology, ERDA/320604.

Background information is presented on sewage treatment in the US and the key issues facing municipal sewage managers. Conventional sewage treatment systems are outlined and alternative and innovation technologies are introduced. Case studies present the experiences of five municipal systems: the technologies involved, the costs, the project problems and subsequent solutions, the energy considerations, and the current status of each project. Some of the lessons learned and future possibilities for the application of appropriate technologies to sewage treatment and conversion are reviewed. Each chapter includes a glossary and abbreviation list, reference sources, and a list of agencies and people who can provide further assistance. (ERA citation 08:049454)

DE83016272/GAA PC **A05**/MF **A01**
Snyder Associates, Inc., Essex, CT.
Design and Construction of a Mobile Biomass Gasifier Close-Coupled to an Engine-Generator Set.
30 Apr 82, 77p DOE/R1/10372-T1
Contract FG41-80R110372
Portions are illegible in microfiche products.

Keywords: *Wood, *Biomass, *Gasification, Comparative Evaluations, Design, Construction, Feasibility Studies, Economic Analysis, Biomass Conversion Plants, Gas Generators, Packed Bed, Thermal Efficiency, Cost, Appropriate Technology, ERDA/090122, ERDA/200102, ERDA/140504.

The purpose of this project was to demonstrate hardware that can be used in specific power generation applications to reduce the use of liquid petroleum fuels. Objectives that have been met include the following: (1) a fixed-bed, updraft biomass gasifier that is close-coupled to an engine/generator set has been designed, constructed and operated; (2) a design approach has been followed that utilizes locally available materials and construction methods; (3) a cost analysis has been completed to project the costs of power generated with a 2-kw biomass powered generator set - this power cost has been compared with the cost of power generated in the same engine/generator when the system is operated on gasoline; (4) a technical report, technical drawings and two public articles have been produced to disseminate project results. The cost of electric power derived from gasoline and biomass have been estimated to be $1.10 and $2.25/kw-h (1982 dollars) respectively. The author has concluded that small biomass gasifiers close-coupled to engine/generator sets are not cost competitive in the 1981 marketplace. When applied to small-scale electric power generation applications, biomass gasification is labor intensive, capital intensive, and presents hazards that may require significant product liability costs for the small manufacturer. The low thermal efficiency of the internal combustion engine lowers the overall thermal efficiency of the biomass electricity conversion process to 9.9 percent. The resulting system is approximately three times as heavy as a simple engine/generator that is gasoline powered; thus, mobility is restricted. It is recommended that large-scale systems be investigated to determine whether labor and capital costs can be reduced. (ERA citation 08:048772)

DE83017866/GAA PC **A04**/MF **A01**
Battle (Mark) Associates, Inc., Washington, DC.
Development of a Commercialization Strategy and Performance of Special Projects for the Office of Inventions and Small-Scale Technology. Final Report.
27 May 81, 64p DOE/CS/10135-T1
Contract AC01-80CS10135

Keywords: *Energy, *Technology assessment, Anaerobic Digestion, Commercialization, Efficiency, Energy Demand, Evaluation, Geothermal Energy, Heat Recovery, Inventions, Manures, Passive Solar Heating Systems, Performance, Program Management, Surveys, Waste Heat Utilization, Water Heaters, ERDA/299000.

In developing evaluation criteria, issues relating to the application of appropriate business and investment techniques were given careful consideration. A discussion of specific criteria used and projects selected is presented. The final plan developed for each project is discussed in detail. The national commercialization plan is presented. The DOE regional manager survey is described and the results are summarized. (ERA citation 08:055885)

DE83018210/GAA PC **A03**/MF **A01**
National Center for Appropriate Technology, Butte, MT.
Drying Wood with the Sun: How to Build a Solar-Heated Firewood Dryer.
Aug 83, 26p DOE/CE/15095-3
Contract AC01-82CE15095
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Keywords: *Wood, *Solar Drying, *Solar heating systems, Construction, ERDA/140909, ERDA/299001.

Construction details are given for a solar-heated firewood dryer along with some helpful hints for the wood burner. Appendices list DOE Appropriate Technology small grants related to wood drying and wood burning. (ERA citation 08:053801)

DE83900279/GAA PC **A04**/MF **A01**
Zaininger Engineering Co., San Jose, CA.
Benefits to Utility Systems of Coproduction of Methanol and Electricity. Final Report.
H. W. Zaininger, and D. J. Bell. Sep 82, 66p EPRI-AP-2587

Keywords: *Methanol, *Industrial plants, *Electric power, *Coal, Production, Coal gasification, Economic analysis, Petroleum, Boiler fuels, Power generation, Optimization, Capacity, Cost, Electric utilities, ERDA/200102, ERDA/090220.

Electric utilities have a continuing need for clean liquid fuels for electric power generation in the near and intermediate term. One potential alternative to petroleum oil is methanol produced by adding a once-through methanol synthesis to coal gasification-combined cycle plants. An initial assessment of the potential benefits of installing methanol and electricity coproduction units was performed in this study. The project results indicate substantial potential savings to systems using relatively large quantities of oil-fired generation by adding once-through methanol synthesis to coal gasification-combined cycle units. Although potential savings are less for utility systems using a large percentage of coal-fired generation, total capital requirements for expanding such systems could be reduced, even though capital must be spent for the methanol producing facilities. (ERA citation 08:000526)

DE83900801/GAA PC **A06**/MF **A01**
Dow Chemical Co., Midland, MI.
Demonstration of Solar-Energy Conversion of Agricultural or Industrial Wastes to Fuels. Final Report.
J. A. Morris, D. J. Milligan, J. A. Quick, Jr., and G. W. Mann. Aug 79, 113p TENRAC/EDF-017

Keywords: *Algae, Production, Harvesting, Fermentation, Pilot plants, Methane, Ethanol, Nitrogen, Phosphorus, Bioassay, Nutrients, Productivity, Salinity, Pesticides, Water quality, Saccharose, Anaerobic digestion, ERDA/140504, ERDA/090122, ERDA/090222.

The investigation reported was to evaluate the potential of using marine algae in the production of renewable energy, to investigate the technical feasibility of such a system, and to identify the problems that must be resolved for the process to be successful. Techniques for producing algae biomass were conducted in 750-gallon outdoor pools and in a one-acre pilot plant. Algae produced from the one-acre pilot plant was used to evaluate various harvesting techniques. Both algae harvested from the pilot plant and from the smaller experimental pools were used for conversion studies in laboratory-sized anaerobic fermenters. (ERA citation 08:012099)

DE83900814/GAA PC **A05**/MF **A01**
Texas A and M Univ., College Station. Center for Energy and Mineral Resources.
On-Site Energy Production from Agricultural Residues. Final Report.
E. A. Hiler. Apr 82, 83p TENRAC/EDF-074

Keywords: *Energy source development, *Agricultural wastes, *Gasification, Cotton, Sorghum, Maize, Rice, Calorific value, Fluidized bed, ERDA/140504, ERDA/090122, ERDA/299003.

Gasification experiments were carried out in a 51 mm diameter fluidized bed using cotton gin trash, sorghum stalks, corn cobs and rice hulls as feedstocks. Differences exist in the gas composition and heating value produced by these feedstocks, but each can be used satisfactorily in a fluidized-bed gasifier. The predominant products of gasification suitable for combustion are carbon monoxide, hydrogen and methane. Preferred operating conditions are 760 exp 0 C at atmospheric pressure. The quality of gas produced at these conditions is primarily a function of the fuel-to-air ratio. Typical heating values of gases produced by gasification are: cotton gin trash-6.26 MJ/m exp 3 , sorghum stanks-7.74 MJ/m exp 3 , rice hulls-9.71 MJ/m exp 3 , and corn cobs-8.22 MJ/m exp 3 . Particulate removal from the low energy gas produced by a 30 cm diameter fluidized bed was evaluated using a two-stage cyclone. (ERA citation 08:012104)

DE83900875/GAA PC **A08**/MF **A01**
Texas A and M Univ., College Station.
Ethanol Production in Small- to Medium-Size Facilities. Final Report.
E. A. Hiler, C. G. Coble, and H. P. O'Neal. Apr 82, 152p TENRAC/EDF-066

Keywords: *Ethanol, *Industrial plants, Design, Testing, Field tests, Energy efficiency, Maize, Sorghum, Sugar cane, Energy balance, ERDA/140504, ERDA/090222.

In early 1980 system design criteria were developed for a small-scale ethanol production plant. The plant was eventually acquired from Coulter Copper and Brass Company in Toronto and was installed on November 1, 1980. It has a production capacity of 30 liters per hour; this can be increased easily (if desired) to 60 liters per hour with additional fermentation tanks. Sixty-six test runs have been conducted to date in the alcohol production facility. Feedstocks evaluated in these tests include: corn (28 runs); grain sorghum (33 runs); grain sorghum grits (1 run); half corn/half sorghum (1 run); and sugarcane juice (3 runs). In addition, a small bench-scale fermentation and distillation system has been used to evaluate sugarcane and sweet sorghum feedstocks prior to their evaluation in the larger unit. In each of these tests, evaluation of the following items was conducted: preprocessing requirements; operational problems; conversion efficiency (for example, liters of alcohol produced per kilogram of feedstock); energy balance and efficiency; nutritional recovery from stillage; solids separation by screw press; chemical characterization of stillage including liquid and solids fractions; wastewater requirements; and air pollution potential. (ERA citation 08:012103)

DE83900881/GAA PC **A05**/MF **A01**
Southwest Research Inst., San Antonio, TX.
Cottonseed Oil as a Diesel-Engine Fuel. Final Report.
H. E. Staph, and J. J. Staudt. 31 Jul 82, 97p
TENRAC/EDF-070-Pt.1

Keywords: *Diesel engines, *Oilseed crops, *Fuels, Fuel substitution, Diesel fuels, Performance, Economics, Cost, Mixtures, Testing, ERDA/330800, ERDA/330102.

If diesel fuel becomes unavailable for any reason, can diesel powered farm equipment function on alternate fuels from energy crops that are available on the farm. This project sought to gain some insight into this question through the use of once-refined cottonseed oil as fuel in a typical unmodified agricultural diesel engine. The engine used for test was an International Harvester Model DT-436B 6 cylinder, inline, direct injection, turbocharged engine of approximately 175 brake horsepower at 2500 rpm. The engine was run on a stationary stand using blends of reference diesel fuel (DF-2), once-refined cottonseed oil (CSO), and transesterified cottonseed oil (ESCO). The latter is cottonseed oil which has been processed to give a methyl ester instead of a glyceride. The volume percent blends of fuels used in the tests ranged from 100% DF-2, to 20/80 DF-2/CSO, 50/50 DF-2/ESCO, 50/50 CSO/ESCO, and 100% ESCO. The test procedures and results are presented in this volume. The results suggest that ESCO would probably be a satisfactory substitute for diesel fuel, but more testing is required. None of the fuels tested is a cost effective alternative to diesel fuels. ESCO presently costs four to five times as much as commercial diesel fuel. (ERA citation 08:012656)

DE84000232/GAA PC **A03**/MF **A01**
Brevard Community Coll., Cocoa, FL. Energy and Energy Conservation Workshop for High School Faculty.
Module Four: Building Construction.
1980, 42p DOE/IR/10037-T3
Contract FG05-79IR10037
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Keywords: *Buildings, *Energy Conservation, Air Flow, Building Materials, *Construction, Curriculum Guides, Ducts, Educational Tools, Glass, Orientation, Size, Thermal Insulation, Training, Walls, Windows, ERDA/320900, ERDA/320100.

The following are included: information on materials and sizing of ductwork, selection of insulation, including duct insulation, attic and wall insulation, weatherstripping, window placement and selection of glass, door locations, building orientation, and selection of surface treatments for reflection or absorption. (ERA citation 08:055930)

DE84000261/GAA PC **A04**/MF **A01**
Fielder (Mary V.), Gainesville, FL.
High-Efficiency Cooking Utensil for Use on Electric Stoves. Appropriate Technology Small Grants Program. Final Report.
M. V. Fielder. May 81, 58p DOE/R4/10102-T1
Contract FG44-80R410102
Portions are illegible in microfiche products.

Keywords: *Burners, *Containers, Design, *Food, Stoves, Testing, Thermal efficiency, ERDA/320101.

Design criteria were developed for an energy efficient pan. The criteria included: fabrication from a metal that not only is high in heat transfer, but that also has high heat retention; be shaped to surround and fit the standard burner element well; and have a well fitting lid. Such a pan was designed, and three prototypes were constructed. All three prototypes met the above criteria. The prototypes were tested by a consulting firm, and one of the prototypes performed more efficiently on every test than any of the tested commercial cookware. (ERA citation 09:000679)

DE84000283/GAA PC **A02**/MF **A01**
John C. Campbell Folk School, Brasstown, NC.
Two-Story Solar Greenhouse. Final Quarterly Report (Appropriate Technology) for Period Ending March 31, 1980.
1980, 10p DOE/R4/10147-T1
Contract FG44-80R410147
Portions are illegible in microfiche products.

Keywords: *Greenhouses, Fuel consumption, Performance, *Tomatoes, Trees, ERDA/140901.

Over the winter of 1981-82, greenhouse was able to sustain plant life without any additional heat. Both eatable and noneatable plants were maintained. Quantity of production was not able to be calculated due to change of personnel responsibilities. Greenhouse is well designed for both winter and summer operation. Surrounded by deciduous trees, greenhouse does not overheat in the summer (in fact, more direct sunlight would probably be beneficial). Winter heating can exceed 90 exp 0 F. Although not scientifically accurate, the oil consumption for the heating of Keith House was reduced an estimated 2000 gallons (or 28%). It is impossible to credit the greenhouse with this reduction totally, since storm windows were added to the building. We are satisfied with the greenhouse both with regard to its production and energy saving capacity. (ERA citation 09:000384)

DE84000371/GAA PC **A05**/MF **A01**
Mountain Community Workshop, Berea, KY.
Waste Not - Want Not. DOE Appropriate Technology Small Grants Program.
1981, 77p DOE/R4/10084-T1
Contract FG44-80R410084
Portions are illegible in microfiche products.

Keywords: *Waste recycling, Bibliographies, Communities, Kentucky, Planning, Recycling, Surveys, ERDA/320604.

The work reported was to look at various alternatives for local solid waste management and develop an implementation strategy for a resource conservation and recovery plan for the community of Berea, Kentucky. A library on recycling and conservation of resources was compiled, and state and local plans were examined. To get a better understanding of how the community would respond to a waste reduction and recycling program, a series of surveys was conducted. A community recycling project plan is proposed. (ERA citation 08:057284)

DE84000374/GAA PC **A02**/MF **A01**
Environmental Alternatives, Inc., Louisville, KY.
Urban Alternative Homestead.
1981, 11p DOE/R4/10089-T1
Contract FG44-80R410089
Portions are illegible in microfiche products.

Keywords: *Houses, Composting, *Energy conservation, Fireplaces, Food processing, Solar cooling systems, Solar space heating, Storm doors, Storm windows, Thermal insulation, Toilets, ERDA/320101, ERDA/140901.

The energy-efficient model home was completed. Work was done on the inside of the house to insulate and finish the walls, build displays on insulation, fireplaces and wood heat, and educational signs depicting the workings of a building designed with active and passive solar heating and cooling. The grant made possible the installation of a Clivus Multrum composting toilet with food trap, also, and educational materials on the workings of the clivus. It made possible displays on window treatments, storm windows and doors, and installation of donated kitchen cabinets and appliances, as well as a donated furnace and ductwork. These items have made it possible to have the demonstration house open five days per week for over two years, with literally thousands of school classes, as well as adult classes taking tours at least three days per week. Literally thousands of persons have taken tours of the house where reams of educational handouts are available, and over fifty conservation workshops have been held in two years. Without the finishing touches on conservation provided by this grant, these thousands of persons would have missed this opportunity to learn about energy conservation. (ERA citation 08:057256)

DE84000381/GAA PC **A03**/MF **A01**
Nuttle (David A.), Raleigh, NC.
Innovative Conservation Housing. Final Progress Report.
D. A. Nuttle. 1983, 38p DOE/R4/10493-T1
Contract FG44-81R410493

Keywords: *Algae, *Houses, *Waste water, Composting, Cultivation, Curtains, Design, Passive solar heating systems, Recycling, Supports, Thermal mass, ERDA/140901, ERDA/320101.

A new passive solar thermal storage brick was developed and tested. A new insulating curtain concept was developed to assist in passive solar heating and cooling. A steel truss was designed to replace the wood truss in solar attic applications where the wood truss typically suffers some 50% loss of structural strength. Improvements were made of the dry composting toilet and grey water recycling for homes. An algae cultivation system was created for production of food, feed, fertilizer, or biomass as needed for home, farm, or industry. New concepts were explored in the areas of economy shelter, solar hot water heating, home generation of electricity, edible landscapes and other home food production, growing of fiber crops for cottage industry, storage, insulation, solar cooking, and solar refrigeration. (ERA citation 09:000409)

DE84000382/GAA PC **A02**/MF **A01**
Peckworth (Ralph H.), Charlotte, NC.
Solar Greenhouse and Warm Room with a Spiral Piping System for Hot Water and a Low-Cost Building-Construction Method. Final Report.
R. H. Peckworth. 1983, 15p DOE/R4/10504-T1
Contract FG44-81R410504
Portions are illegible in microfiche products.

Keywords: *Construction, *Greenhouses, *Buildings, Attached greenhouses, *Energy conservation, Recycling, Solar collectors, Solar space heating, Waste product utilization, ERDA/320100, ERDA/140901, ERDA/141000.

This project involved the construction of two small buildings, each mounted on skids, so that, if desired, they could be moved to various sites to demonstrate the following energy proposals: the use of a combination greenhouse and warm room as an addition to an older house for an economical heating solution; the use of PB (polybutylene) black flexible pipe as a solar water heating collector housed in the above solar area; and the use of COST FREE BUILDING BLOCKS made from readily available recycled waste material, namely empty steel and tin cans, repacked in used corrugated cartons. These blocks, laid up into a wall, using glue instead of mortar, make an excellent core wall that can later be covered with protective surfacing, perhaps a rigid foam plastic surface. (ERA citation 09:000705)

DE84000389/GAA PC **A02**/MF **A01**
North Carolina State Univ. at Raleigh. Dept. of Mechanical and Aerospace Engineering.
NCSU (North Carolina State University) Solar Energy and Conservation House. Final Report.
Oct 81, 19p DOE/R4/10141-T1
Contract FG44-80R410141

Keywords: *Houses, Attached greenhouses, *Energy conservation, Performance testing, Rock beds, Solar space heating, Solar water heating, Trombe walls, ERDA/140901.

A passive solar energy house has been built adjacent to the NCSU McKimmon Continuing Education Center. The house contains a two-story embedded sunspace, two Trombe walls, active solar hot water heating, thermal storage in a rock filled ceiling/floor, and numerous research treatments, and energy conservation features. (See attached photo brochure; Appendix 1). The house is completely decorated and furnished in an attractive manner and the exterior architecture is traditional and has broad consumer appeal. It is also thoroughly instrumented to monitor performance. The house is open to the public on weekends and numerous people come to visit on their own initiative and others take advantage of the close proximity to McKimmon while there attending conferences. The house will influence and motivate large numbers of people to consider solar and energy conservation facets in their homes and will provide data to substantiate performance to prospective home buyers and meaningful data on design and construction for builders. (ERA citation 08:057082)

DE84000395/GAA PC **A03**/MF **A01**
Rehder (John B.), Knoxville, TN.
Designs and Applications for Floating-Hydro Power Systems in Small Streams.
J. B. Rehder. 1 Jan 83, 45p DOE/R4/10415-T1
Contract FG44-81R410415

Keywords: *Hydroelectric power, *Plant layout, *Industrial plants, *Turbines, Bibliographies, Design, Reviews, Uses, ERDA/130700.

The project focuses on an appropriate technology for small-scale hydro power: floating waterwheels and turbines. For background, relic and existing systems such as early floating mills, traditional Amish waterwheels, and micro-hydro systems are examined. In the design phase of the project, new designs for Floating Hydro Power Systems include: an analysis of floatation materials and systems; a floating undershot waterwheel design; a floating cylinder (fiberglass storage tank) design; a submerged tube design; and a design for a floating platform with submerged propellers. Finally, in the applications phase, stream flow data from East Tennessee streams are used in a discussion of the potential applications of floating hydro power systems in small streams. (ERA citation 08:057040)

DE84000429/GAA PC **A03**/MF **A01**
Buckhorn Children's Center, KY.
Construction and Installation of Low-Cost Energy-Conservation Devices on Existing Residential Structures. Final Report.
1983, 31p DOE/R4/10491-T1
Contract FG44-81R410491
Portions are illegible in microfiche products.

Keywords: *Construction, *Houses, *Energy Conservation, *Greenhouses, Heat Storage, Passive Solar Heating Systems, Retrofitting, Shading, Shutters, Solar Water Heaters, Thermal Insulation, Windows, ERDA/320101, ERDA/140901, ERDA/140907.

Through the Neighborhood Housing Services, Incorporated of Charlotte, a series of hands-on workshops and a demonstration site was provided to enable residents of the Plaza-Midwood Neighborhood to build and install a variety of low-cost, durable, small scale, energy conservation systems. This experimental approach enabled homeowners to apply specific technologies to their own homes. These cost effective measures were designed to encourage both self reliance and the use of renewable resources. The weekend projects included protected entry, numerous moveable window insulation devices, solar air collector/greenhouse, window greenhouse and water storage tubes. The building used for retrofit was the office for the Neighborhood Housing Services (NHS), a nonprofit corporation formed to help revitalize residential structures and maintain the economic, racial, and social character of existing neighborhoods. The particular neighborhood involved was Plaza-Midwood and covers approximately a 2 square mile area. The neighborhood housing stock is of the 1910 to 1940 variety with the predominate architectual style being bungalow frame, having 1000 to 1900 square feet in area. The neighborhood is a racially integrated one, with about 70% of the residents being homeowners. An estimated 1700 housing units are in this area. The NHS office presently serves as a resource center for area residents who need loans and/or construction assistance. Providing a continuing educational program is a function of this organization. The Grant provided a significant contribution as a resource for energy conservation mined residents. A resource room displaying procedures and diagrams for the various projects in this proposal was established. Additional resource literature was provided and used by local residents. (ERA citation 09:000704)

DE84000492/GAA PC **A11**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Risk-Management Guide.
G. J. Briscoe. Sep 82, 226p DOE/SSDC-76-45/11-Rev.1, SSDC-11-Rev.1
Contract AC07-76ID01570

Keywords: *Safety, *Occupational safety and health, Data analysis, Occupational safety, ERDA/570000.

The role of risk assessment is to provide the necessary information to make decisions regarding the cost effective commitment of resources to accident prevention and reduction. Risk assessment can also be used to determine if a proposed action is acceptable in those situations where it is impractical to eliminate particular hazards. A limitation in this process is that estimates of future losses are necessarily based on probabilities, statistics, and even subjective judgment; and therefore can never be precise. The decision to allocate resources, thus, is always made in the face of uncertainty. The purpose of risk analysis is to reduce that uncertainty as much as practical by providing a framework for the incorporation of all available information regarding the costs and risks of various alternatives. This guide provides some methods for analyzing and presenting this data to management. (ERA citation 09:001362)

DE84000495/GAA PC **A03**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Work Process Control Guide.
M. G. Bullock. Apr 79, 50p DOE/SSDC-76-45/15, SSDC-15
Contract AC07-76ID01570

Keywords: *Safety, Work, Management, *Occupational safety and health, Systems analysis, ERDA/990100, ERDA/570000.

This guide identifies the elements necessary in the development and evaluation of the ingredients that make up the work process. It defines the interrelationships between people, plant, and procedures. Also, it provides managers, supervisors, and safety specialists with concepts, information, and techniques to use in establishing and maintaining adequate worksite control. The analytical tree is designed to set down, in a logical manner, factors which need consideration in a work process system. The tree is to be used in the conventional manner when analyzing an existing system. That is, one considers each element of the tree and makes judgments as to whether the element under consideration is adequate or less than adequate in maintaining adequate worksite control. (ERA citation 09:001719)

DE84000503/GAA PC **A04**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Effective Safety Review.
J. R. Buys. Sep 82, 55p DOE/SSDC-76-45/25, SSDC-25
Contract AC07-76ID01570

Keywords: *Occupational safety and health, *Safety, Management, Personnel, Recommendations, ERDA/570000.

Effective safety review is a key ingredient of a high-quality safety-assurance and loss-control program. It can be performed by independent reviewers or by monitored self-reviewers, acting in accordance with established criteria. It can be accomplished by individual reviewers or by established criteria. It can be accomplished by individual reviewers or by a review board, whichever best fits the review task. Reviewers, in either case, must be carefully selected on the basis of their managerial, technical, or review process capabilities and capabilities balance; their objectivity and independence; and their motivation to do the review task. Properly selected reviewers must be provided with appropriate review criteria in order to properly evaluate review inputs, carry out review activities, and arrive at meaningful, objective, reproducible findings, conclusions, and recommendations. The basic characteristics that reviewers and review criteria, inputs, activities and outputs must possess have been identified in this monograph and are common to all review types. (ERA citation 09:001373)

DE84000811/GAA PC **A02**/MF **A01**
Georgia Univ., Athens.
Drying Grain Using Crop Residence as a Fuel Source. Final Technical Report.
C. Hammond. Aug 82, 14p DOE/R4/10125-T1
Contract FG44-80R410125

Keywords: *Waste recycling, *Agricultural wastes, *Crops, Boiler fuels, Calorific value, Combustion, Cotton, Dryers, *Drying, Experimental data, Heat exchangers, Maize, Refuse-fueled boilers, Temperature measurement, Waste product utilization, ERDA/090400, ERDA/140504, ERDA/320301.

An indirectly-fired biomass fueled furnace was evaluated to determine the feasibility of drying grain using crop residues as a fuel source. The furnace efficiency and total heat delivery were determined. Funds for this project were provided by the Department of Energy through an appropriate technology grant. Stalks and residue were harvested in large round bales using conventional hay-handling equipment available on most farms. Calorimeter tests were made to determine the heat content available in various residues prior to combustion in the Stormor Bio Mass Heat System. This allowed total efficiency measurements by comparing total heat available and total heat delivered to the grain dryer. For example, a bale of cotton stalks returned over 60 percent of the useable heat for an efficiency of 63.7 percent. Other residues such as corn stalks gave slightly lower efficiency but clearly showed that adequate heat could be obtained to dry grain using heated air and no petroleum fuels. The air from the furnace went through an air-to-air heat exchanger to prevent contamination of the grain from smoke and combustion by-products. Although reducing efficiency somewhat, the heat exchanger allows grain or other materials such as peanuts to be dried for human consumption. Some evidence of overheating of the firebox doors was observed which led to some warping of the doors. This warping subsequently made temperature control more difficult, since the air supply and burn rate are directly related. Air temperatures of up to 160 exp 0 F were measured. The results show that biomass combustion as a fuel source to dry grain is possible with fuel savings of about ten cents per bushel at current fuel prices. Thus, the cost of the biomass burner could be recovered in drying some 70,000 bushels of grain. 5 figures, 5 tables. (ERA citation 08:057034)

DE84000837/GAA PC **A03**/MF **A01**
Case Western Reserve Univ., Cleveland, OH.
Relationship of DNA Repair Processes to Mutagenesis and Carcinogenesis in Mammalian Cells. Three-Year Report, February 1, 1981-September 30, 1983.
H. H. Evans. 30 Sep 83, 27p DOE/EV/04472-T3
Contract AC02-77EV04472

Keywords: *Health, Animal cells, Biological repair, Carcinogenesis, Dose rates, EMS, Genetic control, Guanine, Herpes simplex, Liquid column chromatography, Mammals, Mutagenesis, Nitrosamines, Strand breaks, Tracer techniques, Tritium Compounds, X Radiation, ERDA/560151, ERDA/560306, ERDA/550201.

Mutant strains were selected which are deficient in various DNA repair pathways and these were studied with regard to (1) the nature of the defect in repair, and (2) the mutability and transformability of the defective cells by various agents as compared to the wild type parental cells. Lightly mutagenized wild-type cells were infected with irradiated herpes simplex virus (HSV). Cells which repair HSV are lysed so the surviving population is enriched in repair-deficient cells. Six strains which survived two rounds of infection were characterized with respect to their radiosensitivity. (ERA citation 09:003386)

DE84000925/GAA PC **A02**/MF **A01**
Florida Univ., Gainesville.
Biomass-Energized Crop Drier.
L. N. Shaw, D. M. Post, and K. M. Eoff. 1982, 6p CONF-821257-1
Contract FG44-80R410299
American Society of Agricultural Engineers winter meeting, Chicago, IL, USA, 14 Dec 1982.

Keywords: *Crops, *Wood wastes, Design, *Drying, *Biomass, Fuel substitution, Gasification, Internal combustion engines, Performance, Testing, *Waste heat utilization, ERDA/090122, ERDA/140504, ERDA/320304.

Crop drying is one of the most energy-intensive agricultural operations. The concept of a totally self-contained crop drier energized with biomass such as wood chips was proposed. The concept included the use of a gas producer or gasifier to make fuel gas from biomass for an internal-combustion engine used to drive the drier fan. Since nearly 75% of the energy going into an internal combustion engine is lost in heat carried away in the engine exhaust and the cooling system, it was proposed that most of this energy could be reclaimed if the waste heat from the fan power unit was utilized in heating the drying air. The components of the proposed drier were arranged as shown in

Figure 1, with the engine and the gasifier along with the gas cleanup equipment mounted in a duct through which the drying air was drawn before the air entered the bin containing the commodity to be dried. It was invisioned that this biomass energized drier would be used to complement solar crop driers because it could function on cloudy days or at night. This unit might also be used in developing countries where LP gas or fuel oil are in short supply and electricity is not readily available. Results of testing are presented. (ERA citation 08:057002)

DE84001763/GAA PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Cytometry of Mammalian Sperm.
B. L. Gledhill. 11 Oct 83, 18p UCRL-89918, CONF-8310197-1
Contract W-7405-ENG-48
DOE reproductive toxicology workshop, San Francisco, CA, USA, 12 Oct 1983.

Keywords: *Health, Biological effects, Biological radiation effects, Cattle, Chromosomal aberrations, Evaluation, Genetic effects, Hamsters, Histological techniques, Mice, Morphological changes, Quantitative Chemical Analysis, Rabbits, X Chromosome, X Radiation, Y Chromosome, ERDA/550300, ERDA/560152, ERDA/560305.

Male germ cells respond dramatically to a variety of insults and are important reproductive dosimeters. Semen analyses are very useful in studies on the effects of drugs, chemicals, and environmental hazards on testicular function, male fertility and heritable germinal mutations. The accessibility of male cells makes them well suited for analytical cytology. We might automate the process of determining sperm morphology but should not do so solely for increased speed. Rather, richer tangible benefits will derive from cytometric evaluation through increased sensitivity, reduced subjectivity, standardization between investigators and laboratories, enhanced archival systems, and the benefits of easily exchanged standardized data. Inroads on the standardization of assays for motility and functional integrity are being made. Flow cytometric analysis of total DNA content of individual sperm is an insensitive means to detect exposure to reproductive toxins because of the small size and low frequency of the DNA content errors. Flow cytometry can be applied to determine the proportions of X- and Y-sperm in semen samples. (ERA citation 09:001290)

DE84002515/GAA PC **A03**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Job Safety Analysis.
P. V. Pavlov. Nov 79, 43p DOE/SSDC-76-45/19, SSDC-19
Contract AC07-76ID01570

Keywords: *Safety, *Occupational safety and health, Systems analysis, ERDA/570000.

The concepts and techniques for the development and performance of an effective job safety analysis (JSA) are presented and discussed. The elements of an analytic tree are identified. These elements include management controls, identification of a method for job selecting, analysis of the job, incorporation of the JSA into operational systems and monitoring a JSA program. The contribution of employees based on their experience and knowledge is illustrated. (ERA citation 09:001367)

DE84003402/GAA PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Diesel Fuel Extenders and Substitutes.
W. L. Griffith, and A. L. Compere. 1983, 10p CONF-830847-7
Contract W-7405-ENG-26
Energy resource management '83, San Francisco, CA, USA, 23 Aug 1983.

Keywords: *Fuels, *Diesel engines, Diesel fuels, *Ethanol, Fuel substitution, maintenance, Repair, Vegetable oils, ERDA/330800, ERDA/320301, ERDA/330102.

Several technologies for augmenting fuel oils have been demonstrated. The simplest of these is the direct use of vegetable oils as an extender of diesel fuels. In US tests conducted by the Department of Energy, DOE, in conjunction with International Harvester, IH, a major tractor manufacturer, the use of vegetable oils as a direct diesel fuel replacement or extender in field tractors proved unsatisfactory. The joint DOE-IH tests also covered a number of methods for using ethanol in diesel engines, such as macroemulsions and vaporization/ventilation. For the most part, diesel fuel augmentation with these renewable resource materials was not effective in current equipment. This is important, because equipment, such as tractors, is seldom replaced and is critical to the quality of the owner's life in a developing country. Repair may be hampered by logistics difficulties. Thus, there is a considerable need to develop and provide appropriate fuel oil augmentation methods to developing countries, so that they can use renewable resource technology to meet their most critical needs. (ERA citation 09:007834)

DE84003427/GAA PC **A03**/MF **A01**
New Mexico Energy Research and Development Inst., Albuquerque.
Solar Kiln Handbook and Workshops. Final Report.
A. M. Robbins. 31 Jun 82, 44p DOE/R6/12322-T2
Contract FG46-81R612322
Portions are illegible in microfiche products.

Keywords: *Wood, Information, Meetings, *Solar drying, Training, ERDA/140905.

The DOE Appropriate Technology Small Grants Program project entitled Solar Kiln Handbook and Workshops completed three Solar Lumber Kiln workshops and published a text called Solar Lumber Kilns - Design Ideas. In addition, much information was complied and shared in conversations with those that operate solar kilns. The project is deemed a success, by the principal investigator, in that attendance goals were met at each of the workshops and many requests for the publication have been received. Audience participation, interest and enthusiasm was very high. Many compliments have been received concerning the text along with individual requests for obtaining copies. A total of 2250 copies were printed and successfully distributed to the Region VI's five state energy offices county extension services, forestry centers and other energy related agencies. A copy of this text is attached to this report. (ERA citation 09:007412)

DE84003428/GAA PC **A02**/MF **A01**
Alamo Navajo School Board, Inc., Magdalena, NM.
Solar Domestic Hot Water Systems. Final Report.
1984, 6p DOE/R6/12325-T1
Contract FG46-81R612325

Keywords: *Solar water heating, Appropriate technology, *Construction, Low income groups, Market, ERDA/140907.

This report deals with the application of an appropriate technology, namely, solar domestic hot water heaters in a very specialized milieu within the larger society. In bringing solar domestic hot water to the Alamo Navajo Reservation this unique project was involved in the socialization of an appropriate technology. During the period of the project, the people of the Reservation became acquainted with principles of solar heat as used in the domestic hot water units, and learned to construct and install these units into various plumbing conditions. The project has demonstrated that a technology can be brought into a nontechnical community provided the community has a sense of trust in the local representative and the activity is locally based so that recourse on either the manufactured product or the maintenance service will be available. The experience of this project suggests several areas for continued inquiry. (ERA citation 09:007413)

DE84003507/GAA PC **A02**/MF **A01**
Thomas (G. Richard), Stillwater, OK.
Human/Electric Hybrid Vehicle. Final Report.
G. R. Thomas. 16 Mar 82, 7p DOE/R6/12041-T1
Contract FG46-80R612041
Portions are illegible in microfiche products.

Keywords: *Transportation, *Electric power, Appropriate technology, Demonstration programs, Fabrication, Testing, ERDA/330400.

Demonstrations of the electric-assisted pedal vehicle are described. Newspaper photos are included. (ERA citation 09:004927)

DE84003531/GAA PC **A02**/MF **A01**
Oklahoma Electric Cooperative, Norman.
Solar and Weatherization Education for Appropriate Technology: A Community Barn Raising. Final Report. Department of Energy Small Grants Program.
J. Ferrell. 1984, 13p DOE/R6/10992-T1
Contract FG46-79R610992
Portions are illegible in microfiche products.

Keywords: *Solar heating systems, Solar water heating, *Houses, Attached greenhouses, Elderly people, Energy audits, Low income groups, Meetings, Passive solor water heaters, Weatherization, ERDA/140907, ERDA/320101.

The project consisted of two workshops which were open to the general public and those interested in building a low-cost, easily constructed and maintained solar water heating system. The two workshops were jointly sponsored by Oklahoma Electric Cooperative, a local community action program and a non-profit educational organization. Two homes were chosen which belonged to the elderly or low-income homeowners who met income guidelines. Each home was insulated, caulked, weatherstripped and had storm windows installed by workshop participants. The participants learned how to construct and install two low-cost solar water heating systems from readily available materials. One system was a direct gain type, while the other was to operate on a thermosiphon principle. The participants were encouraged to explore how their knowledge might be applied to their homes and others in their communities. Upon selection of the two sites, Oklahoma Electric Cooperative performed an Energy Conservation Assessment, a computerized analysis of the structure's hourly heat loss. Upon completion of the Energy Conservation Assessment, Sunspace workshops conducted an engineering study leading to the design of a solar water heating system for each site. (ERA citation 09:007396)

DE84003542/GAA PC **A03**/MF **A01**
Harambee, Inc., Oklahoma City, OK.
Passive Solar Retro-Fit, Multipurpose Community Center.
23 Apr 81, 34p DOE/R6/10999-T1
Contract FG46-79R610999

Keywords: *Buildings, *Greenhouses, *Solar energy, Attached greenhouses, Cost, Program management, Retrofitting, ERDA/140901.

An appropriate technology monitoring evaluation is given for a project to retrofit a solar greenhouse to a community center in Okalahoma. Progress on the construction is evaluated, and the management and bookkeeping for the project are very briefly described. Appended are correspondence and financial documents related to the project. (ERA citation 09:007399)

DE84003543/GAA PC **A03**/MF **A01**
Campbell (James R.), Carrollton, TX.
Evaporative Precooler Retrofit for Air Cooled Condensers. Small Scale Appropriate Technology Grant Program.
J. R. Campbell. 1984, 32p DOE/R6/10963-T1
Contract FG46-79R610963

Keywords: *Coolers, *Condensers, Air Flow, Evaporative Cooling, Evaporators, Spray Cooling, ERDA/320100.

Three methods of evaporative cooling were evaluated; direct evaporative cooling of the condenser coil (spray directly on condenser coil), wetted media acting as evaporator and eliminator, and a spray type with eliminator. The direct spray achieved the lowest head pressure and greatest energy savings under all conditions. The major disadvantage in applying this method to an existing unit not designed for direct evaporative cooling is the inevitable build up of scale and decrease in heat transfer of the condenser. The direct spray type system should not be considered without some type of water treatment. The wetted media provided a temperature that had a closer approach to wet bulb temperature and less stratification than the spray system with eliminator. Its primary disadvantage was a reduction in air flow to the condenser of about 14%. This reduced air flow limited the effectiveness of the system at higher wet bulb temperature and could cause the condenser to use more energy as wet bulb approached dry bulb temperature. The spray with eliminators appears to be the best compromise for areas which have the possibility of high wet bulb temperature from time to time. The primary disadvantage, other than the somewhat lower approach to wet bulb, is the duct work required to allow the spray system and eliminator to be installed. A fourth method was considered - injection of precooled air to the condenser coil. Under this approach the condenser coil functions normally with an injection system around its perimeter. (ERA citation 09:006068)

DE84003549/GAA PC **A02**/MF **A01**
Sunspace, Inc., Ada, OK.
Solar Community Appropriate Technology House. Report on Phase II of the Monitoring Program.
1984, 21p DOE/R6/10998-T1
Contract FG46-79R610998
Portions are illegible in microfiche products.

Keywords: *Houses, *Coolers, *Solar water heating, Computerized simulation, Cooling systems, Design, Heat exchangers, Performance, Tubes, Underground, ERDA/140907, ERDA/140901.

The first phase of the project consisted of reworking a typical house of the sort occupied by many of Oklahoma City's low-income residents so that it made minimum use of energy in general and maximum use of solar energy. After the systems were installed and operating, some inexpensive monitoring systems were installed to collect data about how they were working. The analysis of the data collected during the first year of this project indicated that some of the systems were not working as well as expected. It was decided to continue the project for an additional few months in order to correct some of these problems. While this work was going on, Oklahoma City Community Action (OKC CAP) gathered more data on the performance of the underground air cooling system, and, once modifications on the solar water heater were complete, on the water heater. The present report analyzes these data that OKC CAP collected. Briefly, the analysis shows that: (1) the computer program developed to model the performance of underground cooling systems (earth-air heat exchangers) did an excellent job of predicting the performance of the system built as part of this project. This success suggested that the computer simulation model might be of use to other people and organizations working with earth-air heat exchangers. Unfortunately, although the model was successful in predicting system performance, the system did not provide sufficient cooling to meet the demands of an Oklahoma summer. This report discusses this problem and outlines the conditions under which an earth-air heat exchanger system might make economic sense; and (2) modification of the solar water heater dramatically improved its performance. Before the reworking of the unit, daily high water temperatures were in the range of 90 exp 0 to 100 exp 0 F. After the reworking the water regularly reached temperatures approaching 150 exp 0 F. (ERA citation 09:007398)

DE84004392/GAA PC **A04**/MF **A01**
Maryland Univ., College Park.
Preservation of Fresh Solid Foods by Gas Exchange. Final Report of Phase I.
30 Sep 80, 66p DOE/CS/40075-T1
Contract AS01-77CS40075

Keywords: *Food, Energy analysis, Energy conservation, Equipment, Food industry, *Food processing, Gases, Preservation, Research programs, ERDA/320303.

GASPAK is a new system for preserving fresh, solid foods through gas-exchange methods. Its objective is to stabilize or at least significantly extend like-fresh, high-quality shelf-life at ambient and/or chilled temperatures. This is a brief, comprehensive final report of Phase I of a projected three-phase GASPAK project carried out by the University of Maryland. Work to date indicates that through gas exchange procedures the like-fresh quality of peeled and sliced apples and potatoes can be maintained for extended periods. This was determined through gas exchange processing in a device engineered specifically for the purpose and by laboratory tests. From an energy consumption standpoint, it was determined that for more acid (less than ph 4.6) foods at least, the energy cost for the process itself is about one-fourth that required for canning or freezing. It was also determined that total energy costs from harvest to the consumer are approximately half those for canning or freezing. (ERA citation 09:010138)

DE84004466/GAA PC **A09**/MF **A01**
ESG, Inc., Atlanta, GA.
Midwest Appropriate Technology Small Grants Program Project Summaries.
Oct 83, 178p DOE/CH/10122-19
Contract AC02-82CH10122
Portions are illegible in microfiche products.

Keywords: *Biomass, *Education, *Energy conservation, *Energy source development, *Solar energy, *Wind power, Demonstration programs, Energy policy, Financial incentives, National Government, Research Programs, State Government, Technology Transfer, ERDA/290200, ERDA/293000.

This document contains Project Summaries and Assessment Memorandums on 84 projects funded under the Midwest ATSGP conducted in Federal Region V. This region encompasses the states of Illinois, Indiana, Ohio, Michigan, Minnesota, and Wisconsin. The projects were reviewed, assessed, and summarized by Energy Systems Group, Inc. under contract to the DOE Chicago Operations Office. The information in this document is organized alphabetically by state, and alphabetically by grantee within each state grouping. More information on these and other ATSGP projects can be acquired through the National Center for Appropriate Technology, P.O. Box 3838, Butte, MT 59702 or through the National Technical Information Service, US Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161. (ERA citation 09:009977)

DE84004482/GAA PC **A04**/MF **A01**
ESG, Inc., Atlanta, GA.
Midwest Appropriate Technology Small Grants Program: Management Analysis.
Oct 83, 65p DOE/CH/10122-18, ESG-83108
Contract AC02-82CH10122

Keywords: *Energy source development, Biomass, Demonstration programs, Education, *Energy conservation, Evaluation, Illinois, Indiana, Michigan, Minnesota, Ohio, Program management, Recycling, Solar energy, Wind power, Wisconsin, ERDA/290500.

This report reviews 84 projects conducted with DOE funding. The projects cover a number of energy-related topics, including biomass conversion, solar energy, wind energy, energy education, energy conservation, and recycling. In an effort to assist DOE-Chicago in analyzing what types of grantees were more successful and why, the projects were ranked and grouped by several variables. To determine if particular characteristics functioned to make one project more successful than another, several statistical tests were conducted. While the results of quantitative testing are somewhat offset by the subjective nature of the project rankings, some patterns did seem to develop: The overall distribution of the projects showed a normal division: 23% superior, 55% average, and 23% poor. No particular grantee type was significantly more successful than the others, but colleges and universities did have fewer highly ranked projects than any other group. Michigan had proportionately more superior projects; Illinois and Ohio proportionately fewer. Grant awards over $40,000 yielded fewer superior projects. (ERA citation 09:009999)

DE84004580/GAA PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Integrated Palm Oil Processing.
A. L. Compere, W. L. Griffith, and J. M. Googin.
1983, 9p CONF-831205-5
Contract W-7405-ENG-26
Miami international conference on alternative energy sources, Miami Beach, FL, USA, 12 Dec 1983.

Keywords: *Fuels, *Vegetable oils, Butanols, By-products, Diesel fuels, Ethanol, Fuel additives, Fuel substitution, Methanol, Processing, Trees, Yields, ERDA/090122, ERDA/140504.

Tree palms are a promising source of fuel extenders and substitutes. They are perennials which bear oil for a period of two to three decades after a roughly four year preliminary growth period. Tree palms are now one of the most efficient energy crops: the best modern varieties can provide up to 6 tonnes per hectare per year of mesocarp and kernal oils. Palms are particularly attractive in areas where more conventional farming would pose a significant threat of laterization of cause major ecological problems. Technology for palm oil production is can range between village level manual operations and highly industrialized mills. Process energy is often supplied by combustion of by-products. Although palm oil is a good energy crop, its physical and combustion properties preclude most use in conventional diesel engines, although palm oil could be directly blended with residual fuel oils for use in some large engines. At present, two uses for palm oil as a diesel fuel extender or substitute appear attractive: microemulsion blends using palm soapstock and monoesters produced by exchanging small alcohols for the glycerol in triglycerides. The amount of alcohols required for conversion of a substantial fraction of palm oil or palm oil soapstock to fuel extenders or substitutes is proportionately small, and, to a major extent, can be supplied by palm processing waste materials. Fermentation and gasification produced alcohols in the one to four carbon range are suitable for use in formulating palm oil based fuels. On a stoichiometric basis, it appears that the value of the palm oil and alcohols are very close to their value as export items. Use of these palm oil fuels could help to decrease balance of payments problems for developing countries, as well as provide a secure market for agricultural products and improved rural employment. (ERA citation 09:009535)

DE84005322/GAA PC **A03**/MF **A01**
New Mexico Univ., Albuquerque.
Lung Cancer Epidemiology in New Mexico Uranium Miners. First Annual Report, 1 April 1983-1 January 1984.
J. M. Samet. Jan 84, 45p DOE/ER/60119-T1
Contract AS04-83ER60119
Portions are illegible in microfiche products.

Keywords: *Safety, *Occupational safety and health, *Mining, *Health, Chronic exposure, Data compilation, Daughter products, Epidemiology, Medical surveillance, Occupational diseases, Pathology, Radioinduction, Tobacco smokes, Uranium mines, ERDA/560151.

This Technical Progress Report for the first nine months of the contract Lung Cancer Epidemiology in New Mexico Uranium Miners describes by task the activities finished or begun since April, 1983. Data collection during the period has included copying all available Grants Clinic examination records for miners in the current study cohort, for completion of smoking and mining histories, and abstracting, coding, and verifying 500 of these records; copying all State Mine Inspector reports and abstracting, coding, and verifying 225 of these records; coding, verifying, and keying all except one batch of employment histories from companies, and tracing gaps in histories through company personnel logs; receipt of output from the National Institute of Occupational Safety and Health with information on New Mexico miners included in the US Public Health Service Colorado Plateau study; and updating some 30 miners from status unknown to status known by means of new information from personnel offices, the Grants Clinic, and interviews in the community. In order to examine the feasibility of a study of later miners, we have created a computer file of working level months (WLM) records, cumulated WLM for each miner for each year, and cumulated WLM for each miner over the years 1967 to 1982. We have records for 10,516 miners not in the current cohort, most of whom began mining in the 1970's. They have relatively low WLM because of their later, briefer mining experience. We have not yet done power calculations based on complete WLM data, 1967 to 1982. We have also not yet collected Grants Clinic examination records for all these miners. (ERA citation 09:010845)

DE84006144/GAA PC **A03**/MF **A01**
National Center for Appropriate Technology, Butte, MT.
Introducing Supplemental Combustion Air to Gas-Fired Home Appliances.
Dec 83, 27p DOE/CE/15095-7
Contract AC01-82CE15095
Portions are illegible in microfiche products. Original copy available until stock is exhausted.

Keywords: *Houses, Air, Appropriate technology, Chimneys, Combustion, Gas furnaces, Planning, US DOE, Water heaters, ERDA/320100, ERDA/421000, ERDA/034000.

The way a home heating furnace works is explained briefly, and techniques are provided for making one work more safely and efficiently. Also explained is how to recognize a combustion-air problem. Code-prescribed formulas are provided for calculating available combustion air. Also provided are code-approved appliance clearances for enclosing furnaces and water heaters, detailed instructions and drawings for installation of several supplemental air options, and summaries of DOE projects related to the topic of supplemental combustion air. (ERA citation 09:014111)

DE84007097/GAA PC **A03**/MF **A01**
National Center for Appropriate Technology, Butte, MT.
Solar Greenhouses and Sunspaces: Lessons Learned.
Jan 84, 37p DOE/CE/15095-8
Contract AC01-82CE15095

Keywords: *Greenhouses, *Solar energy, Appropriate technology, Construction, design, Maintenance, Operation, Performance, Safety, ERDA/140901.

The experiences of the DOE Appropriate Technology grantees provide valuable information for others to use in building and operating better sunspaces and greenhouses. Their experiences are the basis for Solar Greenhouses and Sunspaces: Lessons Learned. This publication is divided into six major categories: design; construction tips; management, maintenance, and safety; horticulture; greenhouse construction workshops; and information sources. Each chapter presents basic background material on the topic and relevant information from selected project reports. A question and answer format is used to present information on ways greenhouses and sunspaces can be improved. This publication has been developed as a supplement to the existing literature to help prospective sunspace/greenhouse owner/builders get started in the right direction. It is not a text book, and is not a substitute for any of the good "how-to" greenhouse books available. Its purpose is to identify common mistakes in design, construction and/or operation that affect performance, and provide useful advice to help consumers avoid these mistakes. (ERA citation 09:028144)

DE84007102/GAA PC **A02**/MF **A01**
National Center for Appropriate Technology, Butte, MT.
Using the Earth to Heat and Cool Homes.
Dec 83, 23p* DOE/CE/15095-6
Contract AC01-82CE15095

Keywords: *Coolers, Appropriate technology, Cooling, Grants, Heat distribution systems, Heating, *Houses, Reviews, *Technology transfer, ERDA/320101.

The types of earth- and water-coupled systems available are described. More information on the advantages and drawbacks of these systems is provided. A five-step, decision-making process that helps the consumer decide which system, if any, is most appropriate for his or her situation is also included. The systems used by several grantees from the US Department of Energy's Appropriate Technology Small Grants Program are described and some of the lessons they learned about this technology are highlighted. A resource list is provided that includes current literature on the technology, organizations that can provide more information, and what to look for when shopping for system equipment. (ERA citation 09:014110)

DE84007422/GAA PC **A02**/MF **A01**
TEM Associates, Inc., Berkeley, CA.
Administrative Support of Regional Appropriate Technology Small Grants Program. Final Report.
Dec 83, 7p DOE/SF/11686-T1
Contract AC03-82SF11686

Keywords: *Solar cooling systems, *Biomass, Chimneys, Passive solar cooling Systems, Pelletizing, Program management, Renewable energy sources, Wind power, ERDA/299000, ERDA/140901, ERDA/140504, ERDA/170000.

The support of the DOE San Francisco Operations Office in the Regional Appropriate Technology Small Grants Program was in two parts: administrative assistance to the DOE regional program manager and technical monitoring of the active grants in Arizona and New Mexico. A final summary of the status of each of the three remaining projects is presented. The three projects are: Sagebrush Pelletizer for Use as a Fuel Source, Demonstration Program Using Wind-Power to Generate Electricity, and Passive Solar Chimney Demonstration. (ERA citation 09:020346)

DE84007725/GAA PC **A03**
Fluhrer (Donald B.), Charles City, IA.
Development of a Self-Contained Heating System for Home and Farm Use. Final Report.
D. B. Fluhrer. 1984, 39p DOE/R7/01107-T1
Contract FG47-80R701107
Paper copy only, copy does not permit microfiche production.

Keywords: *Greenhouses, *Turbines, *Houses, Appropriate technology, Coal, Design, Electric generators, Farms, Fuel substitution, Furnaces, Houses, Maize, Operation, ERDA/320301, ERDA/320101.

A central heating system in a basement garage to heat several farm buildings is described. One of the primary fuels used is cracked corn and fines from a grain drying operation mixed with a small amount of coal. A wind energy system and a greenhouse with solar panels were also part of the project. The design and operation of the various systems are described. (ERA citation 09:016805)

DE84007795/GAA PC **A02**/MF **A01**
Chiarello (Emily), Sioux City, IA.
Solar Assist for Older Home. Final Report.
Aug 81, 20p DOE/R7/01006-T1
Contract FG47-79R701006
Portions are illegible in microfiche products.

Keywords: *Houses, *Solar collectors, *Energy management, *Solar energy, *Construction, Appropriate technology, Construction, Demonstration programs, Solar air heaters, Solar space heating, ERDA/140901.

The work done during this grant period attempted to demonstrate that solar energy is adaptable to large, historic homes. Through careful planning, collectors can be installed in spite of, and without detracting from, the many ornamentations, porches and irregular elevations of this style of architecture. Furthermore, the work done during this grant attempted to demonstrate that a system could be low cost and low technology, made from stock materials found in most local areas or available through mail order. It can be within the capability of a handyman homeowner or local carpenter. Dissemination of information was an important objective of this grant. (ERA citation 09:022242)

DE84007877/GAA PC **A03**/MF **A01**
National Center for Appropriate Technology, Butte, MT.
Heat Recovery Ventilation for Housing: Air-to-Air Heat Exchangers.
Mar 84, 33p DOE/CE/15095-9
Contract AC01-82CE15095

Keywords: *Buildings, *Heat transfer, Air flow, Control, Ducts, Economics, Indoor air pollution, Installation, *Maintenance, Reviews, Uses, Ventilation systems, ERDA/320101.

Air-to-air heat exchangers were researched and developed in the Appropriate Technology Small Grants Program, 1978 to 1981. This publication examines the results of this work as well as provides information for builders, architects and skilled owner-builders on the basics of using air-to-air heat exchangers in residential settings, including: how heat exchangers work; why they are needed and when they are appropriate; how to choose an adequate ventilation rate and a machine that fits the purpose; how to install, control and maintain the machine; assessing the state-of-the-art in this technology; and information on supplies, ventilation standards and where to go for further information on heat exchangers. (ERA citation 09:018681)

DE84008866/GAA PC **A03**/MF **A01**
National Center for Appropriate Technology, Butte, MT.
Window Insulation: How to Sort Through the Options.
B. A. Miller. Mar 84, 38p DOE/CE/15095-12
Contract AC01-82CE15095
Portions are illegible in microfiche products. Original copy available until stock is exhausted.

Keywords: *Energy management, *Buildings, Appropriate technology, Cost, Double glazing, *Energy conservation, Grants, Heat losses, Seals, Thermal insulation, ERDA/320101.

Options available for residential settings are discussed, including: how to identify window insulating devices that can save a significant amount of energy, including a discussion of components and types; how operating window insulating devices compares with using conventional, non-insulating window coverings; how to choose a product that can serve all the functions traditionally required of window coverings; how to avoid problems with do-it-yourself projects; and how to estimate costs and savings with window insulation. In addition, this publication provides information on window choices for new construction, and an overview of current research in window insulation. The appendices provide summaries of selected grant projects, and a reading list is presented for those who want more information on window insulation. (ERA citation 09:022748)

DE84009730/GAA PC **A02**/MF **A01**
National Center for Appropriate Technology, Butte, MT.
Introduction to Biogas Production on the Farm.
Mar 84, 24p DOE/CE/15095-13
Contract AC01-82CE15095

Keywords: *Bioconversion, *Manures, *Methane, Anaerobic digestion, Biomass conversion plants, Bioreactors, Design, Economics, Farms, Production, Research programs, Technology utilization, US DOE, ERDA/090122, ERDA/140504, ERDA/299003, ERDA/290500.

A number of farmers, ranchers, and engineers received support from the US Department of Energy Appropriate Technology Small Grants Program to design, construct, and demonstrate biogas production systems. Many of these projects generated more than just biogas; grantees' work and results have contributed to a growing body of information about practical applications of this technology. This publication was developed to share some of that information, to answer the basic questions about biogas production, and to lead farmers to more information. Section I introduces biogas and the various components of a biogas production system, discusses the system's benefits and liabilities, and provides a brief checklist to determine if biogas production may be applicable to an individual's particular situation. Section II features descriptions of four biogas projects of various sizes. Section III provides sources of additional information including descriptions of other biogas production projects. (ERA citation 09:019870)

DE84009759/GAA PC **A02**/MF **A01**
Bryant (Paul J.), Prairie Village, KS.
Optimization of Wind Turbine Design for SWECS. Final Report, October 1, 1981-October 1, 1983.
P. J. Bryant. 1983, 5p DOE/R7/01221-T4
Contract FG47-81R701221

Keywords: *Turbines, *Wind energy, *Engines, Optimization, Reviews, Tilt mechanisms, ERDA/170602.

Current research to optimize wind turbine designs centers on the most important parameter, the useful lifetime of the rotor assembly. The original cost and maintenance of this portion of a wind machine has traditionally been the most important factor in cost effectiveness. Thus, the effort under this project has concentrated on a rotor design which promises to extend the lifetime of the full rotor assembly. That design improvement includes the integration of a teetered rotor hub and a delta-3 angle. This design concept was proven in helicopter and rotor craft applications. The adaptation to wind turbines has been the primary task of this appropriate technology utilization project. Test rotors, incorporating the teetering hub, delta-3 angle design, have been constructed and tested. The research model provides a full range of settings for a complete evaluation of the relevant parameters; e.g. the delta-3 angle is variable from +70 to -70 exp 0 , the rotor position may be varied fore and aft of the teeter axis, the teeter spring rate is continuously variable, also the teeter and yaw stops are adjustable. The use of a dc generator permits the rotor to change angular speed with wind speed. The lack of a yaw drive allows the rotor to display its own passive yawing rates and accommodation factors as a function of delta-3 angle, rotor-axis position, and teeter spring rate settings. Test rotors and wind machines were assembled for data collection. The equipment was designed specifically for research, i.e., with a range of variables so that the relevant parameters could be evaluated. The controlled velocity testing (CVI) method was adapted for rapid, inexpensive data collection. This technique replaces the more expensive wind tunnel tests. By mounting the test machine and wind turbine above a small truck the testing process was facilitated. The adaptation of the CVT technique expedited this project and set an example for future low cost use of the CVT technique. (ERA citation 09:019973)

DE84009899/GAA PC **A02**/MF **A01**
ESG, Inc., Atlanta, GA.
Project Status Report on Field Research Tasks and Technical Services, June 1, 1983-September 30, 1983.
Oct 83, 12p DOE/CH/10122-20
Contract AC02-82CH10122

Keywords: *Renewable energy, *Buildings, Biomass, Data analysis, Energy systems, Information dissemination, Monitoring, Solar water heaters, Technology transfer, ERDA/299000, ERDA/140907, ERDA/320100.

This status report covers progress during the period June 1, 1983 through September 30, 1983. The work is divided into two areas as follows: (1) Field Measurement, Analyses, and Reporting Related to Building Energy Systems and Biomass Projects. The key effort is on the Class B performance monitoring program, including a limited amount of special data evaluation and analysis. Other work relates to design tools, passive selection criteria, hot water performance documentation, and other renewable systems. (2) Technical Services in Support of Appropriate Technology Program. A total of 84 project files have been reviewed and summarized, telephone contacts and selected site visits are being made on a small number of active projects, and technical information dissemination tasks are underway. A summary paper on project activities was prepared, approved, and finalized for publication. (ERA citation 09:026164)

DE84010082/GAA PC **A08**/MF **A01**
Cardinal Management Associates, Inc., Washington, DC.
Appropriate Technology Small Grants Program Evaluation: Case Studies. Volume III.
Mar 84, 155p DOE/CE/15151-T2
Contract AC01-82CE15151

Keywords: Demonstration programs, *Energy conservation, *Energy management, Evaluation, Grants, Renewable energy sources, Sampling, Solar cells, Solar energy, Waste management, Wind power, ERDA/320000, ERDA/140000, ERDA/299000.

A non-random sample of the Appropriate Technology Program grantees was selected to ensure that the basic goals of the evaluation study were met. Case studies of selected outstanding projects could provide with respect to the Program dynamics associated with success. It was believed that the non-random case study approach would assist us in assessing which approaches have the potential to impact a reduction in our nation's use of non-renewal energy. From this group of projects, 20 projects were selected to highlight in a case study format which illustrates the various types of projects approaches the Program supported. (ERA citation 09:020355)

DE84010090/GAA PC **A04**
Miller (James A.), Kearney, NE.
Direct Gain Passive Solar, Domestic Hot Water and Wind Generation System. Final Technical Report.
J. A. Miller. 8 Jan 82, 66p DOE/R7/01172-T1
Contract FG47-80R701172
Paper copy only, copy does not permit microfiche production.

Keywords: *Turbines, *Wind energy, *Houses, Appropriate technology, Electric generators, Performance, Solar space heating, *Solar water heating, ERDA/140901, ERDA/140907, ERDA/170602.

The passive solar residence was occupied in late October, 1980. During the past year the dwelling was monitored and performed according to design expectations. There have been several hundred people visit the project and there have been several newspaper stories and television spots pertaining to the solar house, the wind energy conversion system, and the solar domestic hot water heater. Considerable time was spent in working with the local Public Power Company on a contract to interconnect the wind system with the public power grid. The double metering system and the rate structure of the Power Company eliminates almost all incentive for a person to purchase a wind energy conversion system with intent to interconnect with the public power grid. At present, based upon limited data, a consumer who owns a wind system is able to realize only about 25% of the total output of a system as compared to what his monthly electricity bill would be without the system. The Jacobs Wind Electric System with the static frequency changer (inverter) interconnected with the public power company has proven to be an excellent unit. A Domestic Hot Water Heater was installed in December of 1980. The unit has provided approximately 60% of the hot water needs for a family of five. The system has caused few problems with the exception of the sensor unit. Other than this one problem the solar DHW system seems to be of high quality and will provide a respectable payback for money invested by a homeowner. (ERA citation 09:030553)

DE84010098/GAA PC **A03**
Energy Research and Information Foundation, Des Moines, IA.Thoreau Center.
Demonstration House and Resource Center for Appropriate Technology. Final Report, October 1, 1981-June 30, 1982.
18 Apr 83, 32p DOE/R7/01204-T1
Contract FG47-81R701204
Paper copy only, copy does not permit microfiche production.

Keywords: *Houses, *Construction, *Energy management, Appropriate technology, Caulking, Energy consumption, Solar water heating, Thermal insulation, Thermostats, Water heaters, Weatherstripping, Windows, ERDA/320101, ERDA/140907.

The Thoreau Center was developed as an effective demonstration for appropriate technology in Des Moines, Iowa. Efforts included: (1) physical improvements for which funding was granted: insulation of walls of the brick house from inside, and painting of walls with vapor-barrier paint; construction of a batch-type or breadbox solar hot water pre-heating system; construction of a variety of window insulation treatments for all windows; evaluation of the Center's energy use over a three year (4th year included as well) period; insulation of basement (office) space using several alternative methods; investigation of various projects, such as the originally proposed greywater system and ceiling fans; and continued emphasis on winterization and low-cost conservation methods such as caulking, weatherstripping, water-heater insulation, lowered thermostat, etc. Services of the Resource Center Library which were supported through grant funds are summarized. (ERA citation 09:020384)

DE84010458/GAA PC **A02**
Missouri Forest Products Association, Jefferson City.
Appropriate Technology Program: Wood Residue for Energy. Final Report.
30 Dec 82, 18p DOE/R7/01246-T1
Contract FG47-81R701246
Paper copy only, copy does not permit microfiche production.

Keywords: *Fuels, *Energy management, *Wood wastes, Appropriate technology, Availability, Energy consumption, Marketing research, Supply and demand, Transport, ERDA/090400, ERDA/140504, ERDA/299003.

We began the project by reviewing the major users and potential users of wood residue for energy. We then reviewed the inventory and sources of supply and began the process of matching the supply up with the potential users. Considerable effort was expended in developing the sources of supply for handling and loading the material and the transportation net work required to assure timely delivery of the material. One of the objectives of the project was to develop a complete and viable delivery system that would assure long range supply at relatively stable prices. This was accomplished by the Missouri Forest Products Association expanding and developing an existing for-profit corporation set up for this purpose. Considerable effort was expended in organizing this entity as a permanent institution. A plan for informing the appropriate people of our work and resources was carried out by being ever available for meetings, phone calls and correspondence. We developed into a center of information about the potential of wood residue as an alternate fuel in specific locations around the State of Missouri. The files developed as a result of this paper of the work are used almost daily to answer related questions. At this writing, there are installations in Missouri which will consume approximately 50,000 tons of wood residue in a year's time. This is short of the goal we set of 214,580 tons. There are, however, projects in the planning or construction phase that will easily consume that quantity of material. Missouri Forest Products Marketing, Inc., which this grant assisted during the past year, will play a strong role in getting this material utilized. The Environmental Engineer established guidelines for potential users to determine the environmental impact of using wood for energy. This assisted in establishing the trade-offs connected with the overall impact of using wood versus other fuels. (ERA citation 09:024662)

DE84010674/GAA PC **A07**/MF **A01**
Cardinal Management Associates, Inc., Washington, DC.
Appropriate Technology Small Grants Program Evaluation. Volume II.
Mar 84, 149p DOE/CE/15151-1-V.2
Contract AC01-82CE15151
Portions are illegible in microfiche products. Original copy available until stock is exhausted.

Keywords: *Technology transfer, Demonstration programs, Evaluation, Government policies, Grants, Program management, Recommendations, Research programs, ERDA/320000, ERDA/299000, ERDA/140000, ERDA/170000.

An introduction to the Appropriate Technology Small Grants Program Evaluation is presented. Program background is presented, including history, guidelines and operation. The evaluation methodology is presented, specifically the problem statement, study limitations and study methodology. The findings of the study are presented and policy recommendations are discussed. (ERA citation 09:024811)

DE84010675/GAA PC **A03**/MF **A01**
Cardinal Management Associates, Inc., Washington, DC.
Appropriate Technology Small Grants Program Evaluation. Volume I. Executive Summary.
Mar 84, 26p DOE/CE/15151-1-V.1-Exec.Sum.
Contract AC01-82CE15151
Portions are illegible in microfiche products. Original copy available until stock is exhausted.

Keywords: *Technology transfer, Demonstration programs, Evaluation, Government policies, Grants, Program management, Recommendations, Research programs, ERDA/320000, ERDA/299000, ERDA/140000, ERDA/170000.

Volume One contains the Executive Summary which provides a concise overview of the study, including a brief description of the Appropriate Technology Small Grants Program and of the study methodology, highlighted key findings and the Evaluation Team's policy recommendations. (ERA citation 09:024810)

DE84010952/GAA PC **A99**/MF **A01**
National Center for Appropriate Technology, Butte, MT.
Appropriate Technology Management Information System.
Feb 84, 763p DOE/CE/15095-14
Contract AC01-82CE15095
Portions are illegible in microfiche products.

Keywords: *Biomass, *Energy conservation, *Geothermal energy, *Hydroelectric power, *Solar energy, *Wind power, Data acquisition, Grants, Information systems, Program management, ERDA/299000, ERDA/320000, ERDA/150000, ERDA/140000, ERDA/170000, *Data bases.

From 1978 to 1981, the Department of Energy (DOE) awarded more than 2200 small grants worth more than $25 million to individuals, organizations and small businesses across the nation for the purposes of researching, developing and demonstrating appropriate technologies. Grants were given in the full range of technology areas, including conservation, solar, biomass, wind, geothermal, and hydro power. The final report from each DOE grantee was reviewed in an effort to extract information about new ideas and proven concepts that could be of value to the public. To manage the growing wealth of information from the grant reports, and to monitor the report review process, the Appropriate Technology Management Information System (ATMIS), a computer data base, was developed. The ATMIS can classify data into numerous categories (technology area, geographic location, project status, etc.). This manual was generated directly from the data base. (ERA citation 09:024804)

DE84010957/GAA MF **A01**
National Center for Appropriate Technology, Butte, MT.
Technical Assistance and Information Dissemination for the Appropriate Technology Small Grants Program. Final Report, May 4, 1982-February 17, 1984.
1984, 200p DOE/CE/15095-T1
Contract AC01-82CE15095
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Keywords: *Information services, *Technical assistance, Data acquisition, Evaluation, Grants, Information, Information dissemination, Program management, Reviews, ERDA/299000, ERDA/320000, ERDA/140000, ERDA/170000.

The Final Report is organized according to the four major contract tasks, with a description of the activities associated with each task followed by a summary of achievements against task milestones. These tasks are to: provide technical assistance; obtain, review, and evaluate grantee final reports; screen the information in reports for dissemination; and prepare how-to publications and other suitable information products. The appendices that follow present several support documents, including a summary of technical assistance clients and the forms used in delivering the service; data collection forms and technology categories used in the report review process; copies of the information materials that were produced; and the mailing list of organizations and agencies participating in the national dissemination program along with support letters and announcements used to coordinate the program with these organizations. (ERA citation 09:028558)

DE84013287/GAA PC **A02**/MF **A01**
Northampton County Board of Education, Jackson, NC.
North Carolina Energy Conservation Plan. Final Program Report.
1984, 12p DOE/CS/23986-T1
Contract FG01-80CS23986

Keywords: Communities, Appropriate technology, *Energy conservation, Meetings, School buildings, Solar collectors, Solar cookers, ERDA/140901, ERDA/320900.

The Energy Conservation Project's objective was to alert and bring the schools and communities together to conserve energy, making them aware of the energy crisis as well as involve them in energy conservation techniques through surveys, materials, supplies, reviews, energy trends and activities such as live projects in construction of solar panels, cookers, handbooks, workshops, etc. Areas of energy waste were pointed out and dealt with. The project also suggested ways and means of providing for the utilization of natural resources to reduce cost of heating, cooling, lighting and water. The project served to eliminate a large quantity of energy for the schools and communities; students and teachers by participation in the program. The objectives of the project were accomplished and the lack of knowledge of the energy crisis is no longer a myth. The LEA supplemented the project funds in the purchasing of materials, supplies, secretarial assistance, workshops, energy conferences, printing, and consultants fees. The project was a success. (ERA citation 09:032934)

DE84015290/GAA PC **A03**/MF **A01**
Brookhaven National Lab., Upton, NY.
Importance of Energy Efficiency in the Developing Countries.
D. J. Jhirad. 1983, 39p BNL-34301, CONF-830365-2
Contract AC02-76CH00016
Seminar on energy efficiency and conservation, Lome, Togo, Africa, 30 Mar 1983.
Portions are illegible in microfiche products.

Keywords: *Energy management, *Industrial plants, *Brazil, *Economic analysis, Energy conservation, Energy efficiency, Financial incentives, Technology assessment, ERDA/291000, ERDA/320300.

Some results are presented from ongoing work on the economics and potential for energy-efficiency and substitution in the developing countries. The emphasis is on energy conservation in the industrial sector. A detailed financial analysis of one particular technology, industrial heat pumps, is presented for one developing country, Brazil, to illustrate the effect of government financial incentives on the attractiveness of investments in energy efficiency. (ERA citation 09:040278)

DE84750112/GAA PC **A08**/MF **A01**
Norsk Inst. for Skogforskning, Vollebekk.
Integrating Forest Operations with Small-Scale Industrial Activities - Including Energy Conversion. Case Studies Carried out in Colombia, Gambia, India, Norway, Senegal and Thailand.
O. Gislerud, and K. Wibestad. 1981, 168p NP-4750112
U.S. Sales Only.

Keywords: *Colombia, *Gambia, *India, *Senegal, *Thailand, Biomass, Charcoal, *Economic development, Economy, Energy audits, Energy conservation, Energy source development, Energy supplies, Financial data, *Forestry, Forests, Harvesting, Resource development, Statistical data, Wood, Wood fuels, Wood products industry, ERDA/290200, ERDA/299003.

Wood harvested for direct use as fuel accounted for 5-6 % of man's energy consumption. Due to rapidly increasing energy prices, the wood processing industry made greater use of wood residues to meet their energy needs. In many developing countries wood fuels are the only economical source of energy available to a large part of the population. The availability of woodfuels is a question of great concern in many regions and countries. When the drain of wood resources from an area exceeds growth, the result is eventually destruction of the forest. The case study on Thailand is limited to a description of the activities of the Forest Industries Organization, which has for example been successful in establishing an agri-silvicultural program at the village level. The main purposes of the program are better land use, control of shifting cultivation, improved forest utilization, and employment, income, and education for the people. The other five case studies give brief descriptions of socio-economic and energy aspects in the countries covered. In each land the forest and forest industry situation is described and discussed as well as cases of integrated forest and forest industry operations. 76 drawings, 29 tables. (ERA citation 09:007686)

DOE/PE-0016/1/GAA PC **A09**/MF **A01**
Department of Energy, Washington, DC. Office of Policy and Evaluation.
Reprint of Soft Energy Notes: Access to Tools for Soft Energy Path Studies, March 1978 Through July 1979.
Oct 79, 195p

Keywords: *Technology transfer, *Renewable energy, *Energy, Comparative evaluations, Design, Information, Research programs, Technology utilization, ERDA/292000, ERDA/291000.

This reference volume provides wider access to the technical literature in energy-efficiency improvements and renewable-resource technologies. The substance of the volume is reprinted from Soft Energy Notes, a quarterly publication of the International Project for Soft Energy Paths, Friends of the Earth Foundation, San Francisco, California. It contains brief reviews, engineering and cost data, and comparative analyses of contemporary research developments in the United States and abroad. It is presented to the energy systems analysis community as a guide to a rapidly growing body of literature that is often difficult to obtain in a timely way. A complete table of contents - taken from the first part of each issue - is placed at the beginning of this volume. It is pointed out that this reference guide is published for information purposes only. The US Department of Energy does not necessarily approve or endorse this information. (ERA citation 05:007263)

DOE/SF/01963-T4/GAA PC **A03**/MF **A01**
Department of Energy, San Francisco, CA. Region IX.
Summary of Projects: Appropriate-Energy Technology Regional Pilot Program.
1978, 32p
Contract FG03-78SF01963

Keywords: *Energy, *Solar energy, Energy supplies, Grants, Research programs, Energy sources, Solar energy, Energy storage, Solar water heaters, Energy conservation, Biomass, Wind power, *Geothermal energy, Water resources, Aquaculture, Education, ERDA/290500, ERDA/299000, Total energy systems.

Brief summaries are presented of over 100 projects in the Appropriate Energy Technology Program in the following areas: solar; solar storage; solar water heaters; heat recovery; energy conservation; biomass (wood and recycle/aquaculture); wind; geothermal; water; aquaculture; integrated systems; and education and workshops.

DOE/TIC-10125/GAA PC **A10**/MF **A01**
State Univ. of New York Coll. of Environmental Science and Forestry, Syracuse.
Effects of DDT on the Oribatid Mite Community (Acarina:Oribatei) of an Old-Field Herbaceous Community.
D. D. Folts. Nov 72, 210p
Contract EY-76-S-02-3474
Thesis.

Keywords: *Ecology, *Pesticides, *Insects, Biological effects, Contamination, Mineral cycling, Population density, Soils, Terrestrial ecosystems, ERDA/560304, ERDA/553000, ERDA/510100.

Oribatid mites make up approximately 40 to 50% of the total microarthropods in the litter and soil. They are saprophagous, primary consumers in the litter and soil, and as a group could be considered to be on one trophic level. It has been suggested that oribatid mites could affect soil structure and formation by aiding in humification and mineralization, by enhancing the formation of soil structure, and by increasing the depth of the humus (02) horizon. Nutrient cycling and the breakdown of organic matter is believed to be an important function of oribatids. The mites influence nutrient cycling indirectly through the control of fungal and bacterial populations. It is possible that pesticides affect nutrient cycling as an indirect result of changes in oribatid populations. The pesticide DDT, although it has been banned throughout the entire country, is still produced for foreign markets and is in widespread use in many developing countries. The persistance of DDT in soil has been verified by a number of workers. This persistance is of potential danger to the balance of soil microarthropod populations long after the initial effect of the pesticide has disappeared. The objectives of this study were: (1) to determine quantitative changes in numbers of individuals of oribatids as a whole and changes in numbers of individualson the specific level; (2) to determine changes in the structure of the oribatid community that occurred as a result of DDT treatment; and (3) to compare the effect of the DDT on the oribatids of the upper three cm of soil with the oribatids from the fourth cm of soil.

EPRI-AP-1268/GAA PC **A04**/MF **A01**
Westinghouse Research and Development Center, Pittsburgh, PA.
Refractories for Coal Gasification and Combustion Systems.
T. Vojnovich. Jul 80, 57p

Keywords: *Gasification, *Industrial plants, Aluminium oxides, *Coal, Coal gasification, Combustion, Corrosion, Erosion, Refractories, Silicon carbides, Thermal shock, ERDA/010404, ERDA/014000, ERDA/360200.

Information on the state-of-the art of refractories for slagging and nonslagging coal gasification and combustion systems is presented. This information was obtained as part of a program to design refractories for the high temperature erosion/corrosion and slagging conditions found in these systems. Under these conditions the refractories are subject to wear mainly by erosive solids, corrosive gases, or corrosive slags. The conditions leading to wear of the linings are found to be most severe in the slagging gasifiers and combustors; moderately severe in the gas transfer lines and cyclones; and least severe in the fluidized bed reactors based on the experience of pilot and small-scale demonstration plants. Thin refractory linings with substantial water cooling and thick refractory linings with or without water cooling are used in the slagging environments. Silicon carbide and chrome-alumina refractories are the major refractories used in these designs. High purity alumina castable refractories are mostly used for the erosion/corrosion conditions found in fluidized bed reactors, gas transfer lines and cyclones. Fired shapes of alumina or silicon carbide refractories are used instead in gas transfer lines and cyclones where severe wear has been observed. The study indicates the need for improved refractory linings for the slagging and more severe erosion/corrosion environments. Development of improved refractory linings is expected to be useful for gasification systems which may be used by the utilities for the production of electric power in environmentally-clean and cost-effective plants. (ERA citation 05:030094)

ERATL-83/15/GAA PC**$760.00**
ERA Technology Ltd., Leatherhead (England).
Benefits to Industry of Improved Efficiency Motors.
Final rept.,
D. E. Knights. Aug 80, 226p* ERA-80-8

Keywords: *Motors, Efficience, AC motors, Economic analysis, Performance evaluation, Design, Energy conservation.

The report considers the effects on industry of utilizing a.c. motors with operating efficiences superior to those presently available from the manufacturers' standard range of motors. The report includes a survey of the current trends in the design of improved efficiency motors in Europe and America, and investigates what improvements in efficiency and power factor are possible from conventional motor designs. Advice is also given on the benefits of improved efficiency motors and their efficient use in industry. A survey of the criteria used for selecting motors and the future requirements of motor users is also included.

HRP-0903624/5/GAA PC **A02**/MF **A01**
Greater St. Louis Health Systems Agency, Inc., MO.
Cardiac Catheterization: Criteria and Standards.
Nov 80, 19p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

Keywords: *Health, Criteria, Standards, Guidelines, Availability, Accessibility, Quality, Cost effectiveness, Financing, Construction.

These criteria and standards have been developed to provide guidelines for certificate of need review of proposed expenditures which involve the construction, expansion, renovation, or reduction of an adult or pediatric cardiac catheterization service. The primary objective of these criteria and standards is to promote the development of needed, accessible, coordinated, quality, and cost-effective cardiac catheterization services which are acceptable to area residents, to discourage the duplication and proliferation of unnecessary and/or underutilized cardiac catheterization services, and to improve health status. The criteria and standards are divided into seven categories: community need-availability (1 criterion, 6 standards); community need-accessibility (1,5); continuity (1,2); acceptability (1,4); quality (1,10); financial feasibility (1,6); and cost-effectiveness (1,3). Some of the standards contain several elements and measurable requirements. Some cite the source of the standard. No rationale for the standard is given. A glossary of relevent terms is included.

HRP-0903752/4/GAA PC **A02**/MF **A01**
Health Systems Agency of New York City, Inc.
Primary Care: Environmental and Occupational Health Hazards Guide.
Mar 81, 20p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

Keywords: *Diseases, *Occupational safety and health, *Health, Etiology, Signs and symptoms, Public health, Hazardous materials, Exposure.

A quick reference about the environment and work-relatedness of disease is provided in this guide. Its purpose is to alert the primary care practitioner to the role of environmental and occupational factors in the etiology of diseases and to aids in their diagnosis. Included in this booklet is an overview of the problem, a list of common signs and symptoms, a sample environmental and occupational history form that can be photocopied for inclusion in all patients' records, a table of selected toxic exposures and manifestations, agencies and organizations serving as resources, and recommended desk-top references on environmental and occupational medicine. Over the past ten-year period, numerous health problems have been traced to exposures to hazardous substances in the workplace, home, and community environments. Those diseases which have received widespread attention, such as lead poisoning and asbestosis, serve to illustrate the causal relationship between environmental and occupational exposure and human disease. Awareness and suspicion are the practitioner's best tools for tracking down environmentally and occupationally induced disease, and he/she should take an environmental and occupational history on each patient.

HRP-0903763/1/GAA PC **A02**/MF **A01**
Southern New Jersey Health Systems Agency, Bellmawr.
Home Health Services Guidelines.
Mar 78, 10p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

Keywords: *Health, Guidelines, Cost effectiveness, Standards, Criteria.

This publication delineates guidelines for use in the health systems agency's review of certificate of need applications for establishing or expanding home health care services on need, and program costs. Variables of importance in evaluating health care need are the target population, the availability of existing services, and whether the provision of home care has been addressed in the agency's health systems plan. Factors to consider in analyzing the impact of proposed actions on need include what services will be provided; essential versus nonessential or desirable services; whether the program has been well conceived and designed with regard to patient care continuity, indigent populations, and outreach and referral; staff orientation and education programs; service utilization and peer review procedures; and whether the applicant intends to provide home care 24 hours a day, 7 days a week. Cost considerations are the applicant's charge schedule and the cost-effectiveness of providing services directly or by contract. The National League for Nursing's classification of home health care as basic essential, other essential, and desirable services is provided.

HRP-0903764/9/GAA PC **A02**/MF **A01**
Southern New Jersey Health Systems Agency, Bellmawr.
Hospital Bed Addition Guidelines.
Nov 77, 7p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

Keywords: *Health, *Health planning, Guidelines, Standards, Criteria, Planning, Cost effectiveness.

Hospital bed additions are the focus of these guidelines for reviewing medical/surgical, pediatric, and obstetric bed needs. The guidelines deal with the hospital's target population, whether beds in other hospital departments operate at occupancy levels below that recommended by the State, what changes in population are projected for the hospital's service area and how this will affect the need for proposed beds, and the hospital's average length of stay. The State Department of Health recommends the following hospital bed occupancy rates: medical/surgical, 90 percent; obstetrics, 75 percent; and pediatrics, 75 percent. In assessing bed needs, attention must be paid to the accessibility of beds to all persons in the target population regardless of social or economic barriers, outreach mechanisms, adequate staff, and health status indicators. Cost factors of concern are whether bed costs appear to be in line with State standards, whether the hospital's financing method appears sound, whether the bed need can be met via a more cost-effective means such as outpatient services, and whether existing operating rooms and ancillary services like the laboratory and radiology departments can handle an additional workload resulting from bed additions.

HRP-0903769/8/GAA PC **A02**/MF **A01**
Southern New Jersey Health Systems Agency, Bellmawr.
Preventive Screening Programs Guidelines.
Feb 79, 12p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

Keywords: *Health, Cost effectiveness, Diagnosis, Guidelines.

Guidance is presented to facilitate the review of certificate of need and/or Federal funding applications for establishing or operating preventive screening programs. Whether there is a need for preventive screening services depends on the target population size, the prevalence of disease and associated impairment or disability, and the effectiveness of the prevailing health care system in the target area. The likely outcome of not having screening services must be considered, as well as the number of 'abnormal' results that screening will produce. If disease or a health problem is detected via screening, it is then necessary to determine amenability to treatment, i.e., whether it can be corrected or cured. The impact of proposed screening activities can be ascertained by examining the percentage of the target population the program expects to reach, tests or preventive screening services the program will provide, education and outreach mechanisms, and effective followup diagnosis and treatment of persons screened who have abnormal test results. Consideration must also be given to whether the screening program provides for periodic retesting or rescreening of clients. Program cost factors must be evaluated in relation to the program's total cost, cost per test, cost per abnormal test, provision of care to the indigent, and whether the applicant will use government or foundation funds in operating the screening program. Explanatory notes on the preventive screening guidelines are included.

HRP-0903802/7/GAA PC **A07**/MF **A01**
PACE Management Associates, Washington, DC.
Proposed Methodologies for Conducting Assessments of Health Status and Health Systems Status with Regard to Problems of Alcohol and Drug Abuse.
Oct 79, 144p
Sponsored in part by Health Systems Agency of Southeastern Pennsylvania, Philadelphia, and Bureau of Health Planning, Hyattsville, MD.

Keywords: *Drugs, *Health, *Alcoholism, Assessments, Methodology, Drug addiction.

This health systems agency explored methodologies for determining gross needs, unmet needs, and demands for services for alcohol and drug abusers. Three study tasks were specified: (1) resource-based methodology; (2) population-based methodology; and (3) methodologies for interrelating the first and second tasks. The decision was made to recommend an integrated methodology which appropriately interfaces data from populations and data from resources to achieve two principal analyses required by Federal law and the health systems planning taxonomy. This methodology involved an analysis of the population's health status and an analysis of the health system's impact on health status. As shown by a literature review, most alcohol and drug abuse plans developed by single State agencies and even most health systems plans presented data on populations and resources but did not evidence the use of any successful methodologies for interrelating these data elements. The following recommendations are made to achieve an interrelated methodology: use existing treatment data, synthetic estimators, existing survey data, and census tract data to estimate incidence and prevalence data for alcohol and drug abusers; use a small sample survey technique to develop refined data on health, socioeconomic, educational, and other needs; administer a special resource survey to non-network resources to provide both program and client information; administer a specially-designed evaluation protocol to elicit process and outcome data tailored to health systems agency taxonomy requirements; and employ a management review procedure to generate data on costs and manpower. Appendixes are not included with the document.

HRP-0903819/1/GAA PC **A05**/MF **A01**
Three Rivers Health Systems Agency, Inc., Columbia, SC.

Plan for Institutional-Based Cardiac Services.
Apr 80, 77p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

Keywords: *Health, *Health planning, Heart diseases, Criteria, Standards, Quality, Acceptability, Continuity.

This revised section of the health systems plan concerns coronary care units, cardiac catheterization, and open heart surgery. Three health status goals seek to lower mortality from various types of heart disease. The services are then briefly analyzed in terms of health system characteristics, and need methodologies are presented for each. Appendices contain criteria and standards for appropriateness and certificate of need reviews. Those for coronary care units are availability (2 criteria, 2 standards); accessibility (7, 7); cost (4, 7); quality (13, 17); acceptability (4, 4); and continuity (3, 5). Those for cardiac catheterization are availability (3, 9); accessibility (7, 9); cost (5, 10); quality (11, 29); acceptability (4, 7); and continuity (4, 11). Those for open heart surgery are availability (3, 7); accessibility (7, 9); cost (5, 9); quality (12, 27); acceptability (4, 7); and continuity (4, 9). There is no discussion of rationale for the standards. Many standards contain several elements. Although references are given for the main body of the plan, they are not included for the criteria and standards.

HRP-0903822/5/GAA PC **A04**/MF **A01**
Three Rivers Health Systems Agency, Inc., Columbia, SC.
Plan for Radiation Therapy Services.
Jul 80, 56p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

Keywords: *Health, *Health planning, Ionizing radiation, Assessments, Criteria, Standards, South Carolina.

Radiation therapy is a clinical, medical specialty in which patients with cancers or other neoplasms are treated with ionizing radiation. This study, which focuses on megavoltage radiation therapy, considers a needs assessment methodology for radiation therapy services and presents specific criteria and standards for certificate of need and appropriateness reviews of these services. Future need is determined by first multiplying the Three Rivers health service area population by the incidence rate for new cancer to determine the number of new patients. Of these patients, 50 percent will require 30 treatments annually, while 2 percent will require 10 treatments annually. The resulting total number of required treatments is the projected need for radiation therapy services. Following a general discussion of cancer incidence and treatment modalities, the existing radiation therapy system in the Three Rivers area is reviewed and the desired system is considered. Criteria and standards are presented for each of the health system characteristics: availability (3 criteria, 6 standards); accessibility (5, 5); cost (5, 8); quality (5, 13); continuity (3, 6); and acceptability (2, 5). Standards include measurable requirements. No discussion of rationale is presented. Cancer data by specific site, state aid cancer clinics in South Carolina, and the minimum requirements for these clinics are appended. An executive summary, tables, footnotes, and a bibliography are included.

HRP-0903845/6/GAA PC **A04**/MF **A01**
Northern Indiana Health Systems Agency, Inc., South Bend.
Search for Safe Drinking Water,
Margaret A. Hairsine, and Herbert A. Schumm. Aug 81, 68p
Grant PHS-05-P-000212-07

Keywords: *Water pollution, *Water quality, *Potable water, Surveys, Malignant neoplasms, Heart diseases, Cardiovascular diseases, Preventive medicine, Indiana, Tests, Water pollution, Water treatment.

This report correlates information available on drinking water quality with cancer and heart disease and recommends actions to reduce the potential of developing heart disease and/or cancer from materials found in drinking water. Chapter 1 discusses the historical development of safe drinking water while Chapter 2 examines the water treatment process as it stands today. Chapters 3 and 4 investigate the correlation between drinking water and cancer and review the research done on heart disease and drinking water. The potential drinking water problems in northern Indiana are studied in Chapter 5. The results of a telephone survey of the area's water suppliers are presented in Chapter 6. It examines the extent and frequency of tests on drinking water in the northern Indiana area. The survey responses, a listing of water suppliers, and the tests by plants surveyed are all tabulated. A copy of the survey form is appended. Tables, map, and references are included.

HRP-0903887/8/GAA PC **A03**/MF **A01**
Three Rivers Health Systems Agency, Inc., Columbia, SC.
Plan for Institutional-Based Maternal and Newborn Services.
15 Oct 80, 41p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

Keywords: *Health, *Health care delivery, *Children, Obstetrics, Pregnancy, Criteria, Standards, Availability, Accessibility, Costs, Quality, Acceptability, Continuity.

A regionalized approach to the delivery of maternal and newborn services offered in an institutional setting is explained in this service-specific plan. Discussion centers around services for prenatal complication, labor and delivery, post-partum care, and newborn care from birth up to 28 days. The study is divided into 2 components (status and system analysis) for planning obstetric and neonatal services. General criteria and standards follow each discussion of service type, and when plausible, specific standards are established and presented in the appendices for the six basic characteristics. The respective numbers of criteria and standards for obstetric services are availability (3 criteria, 3 standards); accessibility (7, 7); cost (4, 7); quality (5, 6); acceptability (5, 6); and continuity (3, 4). For neonatal special services, the numbers are availability (3, 4); accessibility (6, 6); cost (3, 3); quality (5, 5); and continuity (3, 3). Source and rationale are not presented; measurable statements are in the standards. A modified Hill-Burton formula is used to determine obstetric and neonatal bed need. Tables, appendices, and an executive summary are included.

HRP-0904149/2/GAA PC **A06**/MF **A01**
Oregon State Health Planning and Development Agency, Salem. Office of Rural Health.
Clinic Management Handbook,
Christine Sajewski. Apr 82, 125p
Sponsored in part by Bureau of Health Planning, Hyattsville, MD.

Keywords: *Health, *Health planning, *Management planning, Personnel management, Office management, Office equipment, Financial management, Accounting, Billing, Salaries, Oregon.

This handbook was written to acquaint rural communities with rural clinic management. It is intended to assist small rural health clinics in performing daily and long-term management tasks. The handbook should be helpful to both clinic employees and to the boards of directors of nonprofit rural clinics. Clinic management issues for small rural clinics are very similar to those faced by larger urban clinics. However, the magnitude of the issues and the methods for dealing with them are usually different for rural clinics. This handbook addresses clinic management issues from a rural clinic perspective and discusses the following topics: clinic staffing, personnel policies, recruitment and interviewing, job descriptions and performance reviews; effective management of a rural clinic's reception area; medical record systems suitable for a small rural clinic; information on the components of a financial management system for a rural clinic--accounts receivable, accounts payable, fee schedules, billing and collections, insurance reimbursement, and payroll; information on private foundations that may be potential financial resources for rural clinics; insurance needs of a rural clinic; the Principles of Practice (POP), which is a clinic management document that should be prepared by all clinics; and information on informing the community about a new rural clinic.

HRP-0904237/5/GAA PC **A03**/MF **A01**
United Health Systems Agency, Inc., Concord, NH.
Cardiac Catheterization,
F. Reed Willis. 1980, 30p

Keywords: *Health, History, Trends, Criteria, Standards, Availability, Accessibility, Costs, Quality.

A discussion of the practice of cardiac catheterization in New Hampshire is presented in this report along with guidelines for the rational development of catheterization units in the state. Cardiac catheterization is defined and explained, and its history and trends are reviewed. The cardiac catheterization resources in New Hampshire are described, and criteria and standards are identified. Cardiac catheterization has been available in New Hampshire for over 25 years. Four facilities currently report cardiac catheterization procedures: Mary Hitchcock Memorial Hospital (Hanover); Elliot Hospital (Manchester); Littleton Hospital (Littleton); and Catholic Medical Center (Manchester). Utilization of the cardiac catheterization services in the four hospitals varies according to total procedures, age of patient, type of procedure, and patient residence. The number of cardiac catheterization procedures performed in each hospital by patient age is summarized in table form. The maximum (optimum) volume of cardiac catheterizations which New Hampshire hospitals report they can perform assuming current resources and unlimited patient population is 200 cases at Elliot, 250 cases at Littleton, 350 cases at Catholic Medical Center, and 520 cases at Mary Hitchcock.

HRP-0904467/8/GAA PC **A05**/MF **A01**
American Public Health Association, Washington, DC. International Health Programs.
Primary Health Care Bibliography and Resource Directory,
Joel Montague, Shahnaz Montague, and Edward Capparelli. 1982, 82p ISBN-0-87553-105-9
Contract AID-DSPE-C-0053
Sponsored in part by Bureau of Health Planning, Hyattsville, MD. Library of Congress catalog card no. 82-71980.

Keywords: *Health, Professional personnel, Rural areas, Requirements, Education, Bibliographies.

The purpose of this bibliography is to make information on primary health care activities and programs more readily available to planners, managers, decision-makers, and health personnel in both developed and developing countries. Criteria used in the selection of references for the bibliography include: (1) Usefulness; (2) Timeliness; (3) Access; (4)Cost; (5) English Language. The publication is divided into two sections: (1) an annotated bibliography and (2) a resource directory.

HRP-0904468/6/GAA PC **A06**/MF **A01**
American Public Health Association, Washington, DC. International Health Programs.
Primary Health Care: Progress and Problems. An Analysis of 52 AID-Assisted Projects,
Margaret Burns Pariato, and Michael N. Favin. Aug 82, 104p ISBN-0-87553-106-7
Contract AID-DSPE-C-0053
See also HRP-0904467. Sponsored in part by Bureau of Health Planning, Hyattsville, MD. Library of Congress catalog card no. 82-13843.

Keywords: *Health, *Health care delivery, Communities, Participative management, Design, Management, Costs.

This document chronicles the problems and progress in 52 AID-funded projects in primary health care, many of which began before Alma-Ata. The diversity and scope of these projects demonstrate the wide range of approaches to primary health care. It is still impossible to assess the implications of these approaches; the timeframe has been far too short. However, evidence of progress made provides a convincing rationale to sustain PHC efforts as an alternative to historical approaches of health care delivery.

HRP-0904469/4/GAA PC **A05**/MF **A01**
American Public Health Association, Washington, DC. International Health Programs.
Primary Health Care Issues, Series 1, Number 4. Community Financing of Primary Health Care,
Wayne Stinson. 1982, 93p ISBN-0-87553-100-8
Contract AID-DSPE-C-0053
Sponsored in part by Bureau of Health Planning, Hyattsville, MD. Library of Congress catalog card no. 82-4016. See also rept. no. 3, HRP-0904470.

Keywords: *Health, *Financial management, Financing, Communities, Project planning, Resources.

This paper concerns resource mobilization, with particular emphasis on community participation. It describes ways users of public sector health services have helped defray one-time and recurrent costs and how these contributions fit into the overall picture of primary care financing. It is written for persons who may be thinking about community financing. It recounts where and how such methods have been attempted, what costs they have defrayed, and what kinds of extracommunal assistance they have needed. Its ultimate objective is to help readers fit community financing into an overall financing plan and to suggest ways in which community schemes can be implemented.

HRP-0904470/2/GAA PC **A04**/MF **A01**
American Public Health Association, Washington, DC. International Health Programs.
Primary Health Care Issues, Series I, Number 3. Growth Monitoring of Preschool Children: Practical Considerations for Primary Health Care Projects,
Marcia Griffiths. Oct 81, 75p
Contract AID-DSPE-C-0053
Sponsored in part by Bureau of Health Planning, Hyattsville, MD. Errata sheet inserted. See also rept. no. 2, HRP-0904471, and rept. no. 4, HRP-0904469.

Keywords: *Health, Growth, *Children, Rural areas, Measuring instruments, Education.

The purpose of this paper is to examine the state of the art of growth monitoring as it is undertaken on a regular basis at the community or clinic level in primary health care and nutrition programs throughout the developing world. The paper is intended to present essential findings from research and field experiences on monitoring growth that will enable the primary health care program planner to understand: (1) the activities that comprise a growth monitoring project; (2) the major issues and problems involved in growth monitoring exercises; and (3) some of the lessons learned in various projects and settings.

HRP-0904471/0/GAA PC **A03**/MF **A01**
American Public Health Association, Washington, DC. International Health Programs.
Primary Health Care Issues, Series I, Number 2. Immunizations,
Edward Sabin, and Wayne Stinson. Oct 81, 43p
Contract AID-DSPE-C-0053
Sponsored in part by Bureau of Health Planning, Hyattsville, MD. See also rept. no. 1, HRP-0904472, and rept. no. 3, HRP-0904470.

Keywords: *Health, *Diseases, Services, Communities, Project management.

Immunization against the major infectious diseases is defined as one of nine key basic components of primary health care according to the report of the WHO-UNICEF Conference on Primary Health Care held at Alma Ata in 1978. Even before the primary health care movement, there was universal consensus that essential and basic child health services must include childhood immunizations. Of an estimated one hundred twenty-five million children born every year, approximately twelve million (or nearly 10 percent) die before age one--97 percent of the deaths occurring in developing countries. The major causes of deaths are gastrointestinal and respiratory diseases alone and in combination with malnutrition. A significant portion of these deaths could be prevented by effective infant immunization, yet only about 10 percent of the children in developing countries are properly immunized at present. Expansion of immunization coverage is a necessary and important step.

HRP-0904472/8/GAA PC **A04**/MF **A01**
American Public Health Association, Washington, DC. International Health Programs.
Primary Health Care Issues, Series I, Number 1. Using Radio for Primary Health Care,
William O. Sweeney. Sep 82, 59p ISBN-0-87533-109-1
Contract AID-DSPE-C-0053
Sponsored in part by Bureau of Health Planning, Hyattsville, MD. Library of Congress catalog card no. 82-16284. See also rept. no. 2, HRP-0904471.

Keywords: *Health, *Communications, Radio broadcasting, Rural areas, Mass media, Cost analysis.

The use of radio in Primary Health Care is one technique that has received limited attention in the health literature. While perhaps of limited interest to the clinician, this report has much to say to those responsible for national or regional health programs. It is for this particular audience that it has been written and refereed by professionals with many years of 'hands-on' experience with media in the developing world.

HRP-0904666/5/GAA PC **A10**/MF **A01**
Institute for Health Planning, Inc., Madison, WI.
Development Fees for Health Facilities Construction.
Aug 83, 205p

Keywords: *Construction, *Health, Hospitals, Planning, Design, Services, Construction costs.

This study describes the many financial, legal, planning, and design services that may be used in the development of a complex modern health facility like a hospital. in addition to describing each development service, the study identifies those variables that most influence the cost of each service and provides current examples of service fees or charges. Having examined development services individually, the study proceeds to analyze the broad issues and trends that have influenced costs across multiple services in the past decade or two. These include changes in health facility design, construction methods, modes of financing, and regulation. Also examined are the tradition of percent-based fee structures, the tradition of service competition based on factors other than price, and the lack of industrywide evaluation of construction products and methods. The study should serve as a useful reference for anyone involved in the development of a major health facilities construction project.

HRP-0904763/0/GAA PC **A02**/MF **A01**
Robert Wood Johnson Foundation, Princeton, NJ.
Preventing Tooth Decay: Results from a Four-Year National Study.
Special rept. no. 2,
M. Leon. 1983, 19p

Keywords: *Health, Effectiveness, Cost analysis.

Children's teeth found to be healthier than expected. Most preventive measures proved to be more expensive -- and less effective. The value of water fluoridation underscored.

IBRD-WP-011/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Foregone Benefits and Costs of a Prevented Birth: Conceptual Problems and an Application to the U.A.R.
Staff working paper,
George C. Zaidan. Jan 68, 41p

Keywords: *Cost benefits, *Population control, *Birth control, Benefit cost analysis, Developing countries, Expenses, Productivity, Quality assurance, Developing country application.

This paper treats investment in population control as any other investment and sets as its objective to refine and extend the cost-benefit analysis of such an investment. The essence of this approach is to work out the consumption and productivity streams of an unborn child, and- after appropriate discounting- to subtract the latter from the former to get the net economic benefits of preventing a birth. The benefits are measured in terms of the income stream that becomes available to the economy as a whole, as a result of preventing one birth. The paper seeks then to analyze the assumptions and hence limitations of such a procedure.

IBRD-WP-012/GAA PC **A08**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
French Academic and Private Research on Economic Development Problems.
Staff working paper,
Alexander G. Nowicki. Feb 68, 151p

Keywords: *Research and development, *Economic development, Developing countries, Research projects, Consultants, Reviews, Developing country application.

This paper has been written to acquaint the reader with a French economic development school. This survey concentrates on academic and semi-academic research institutes and consulting firms. The aim of the survey is to report on the major aspects and features of French thinking and research on economic development problems and the major institutions active in this field.

IBRD-WP-013/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Productivity Growth and Development in Latin America.
Staff working paper,
Henry J. Bruton. May 68, 55p

Keywords: *Productivity, *Latin America, Statistical analysis, Policies, Growth, Developing country application.

This paper focuses on the derivation of the 'production function,' i.e., output as a function of, on the one hand, increased inputs of capital and labor and, on the other hand, productivity growth. This leads to a comparison of productivity trends in industrialized countries and in four Latin American countries.

IBRD-WP-014/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Forecasting Steel Demand in Developing Countries.
Staff working paper,
Bertil Walstedt, and Jose Datas-Panero. Jun 68, 68p

Keywords: *Steel industry, *Economic analysis, Consumption, Forecasting, Trends, Steels, Developing country application.

This paper reviews long-term trends and growth patterns in world steel consumption, highlighting factors which, at various stages, have accelerated or slowed growth. It appraises attempts made by the U.N. Economic Commission for Europe to find a general statistical formula which could be used to describe and to project the growth of steel consumption in the world and in its major regions. It next sets out to study the growth of steel consumption in relation to selected macro-economic variables. The study uses geographical cross-section data.

IBRD-WP-016/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Treatment of Population in Bank Economic Work.
Staff working paper,
G. Zaidan, and E. K. Hawkins. May 68, 88p

Keywords: *Economic development, *Demography, Birth control, Developing country application, *Family planning.

This paper provides a general discussion of the interrelationships between population and growth and economic growth with particular reference to the question of defining the conditions under which a country can be said to have a population problem. It provides a brief guide to the evaluation of family planning programs directed to the non-specialist with guidelines enabling him to understand the problems posed by such programs and thus be in a better position to formulate a judgment as to the possibilities for their success.

IBRD-WP-017/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Quantitative Analysis of Urban Water Demand in Developing Countries.
Staff working paper,
Avigdor Meroz. Jun 68, 42p

Keywords: *Urban planning, *Water supply, *Water use, Demand(Economics), Income, Weather, Cost analysis, Forecasting, Developing country application.

This paper reports on an attempt to estimate the effects of income, price, and weather on the consumption of water in urban areas of developing countries and to derive functional relationships between these factors and the demand for water which can be used for forecasting. The study is based on data for 38 cities in Africa, Asia, and Latin America.

IBRD-WP-018/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Review of Past Efforts at Deriving Agricultural Supply Models for Developing Countries.
Staff working paper,
Bernard Oury. Jun 68, 47p

Keywords: *Agricultural economics, Bibliographies, Models, Supply(Economics), Developing country application.

This paper reviews some twelve econometric studies of agricultural producers' behavior in developing countries. In addition, it provides a tentative and more detailed bibliography including also works which, though identified, could not be obtained. It is part of an exploration of the possibilities of deriving an agricultural supply model for developing countries. The author concludes that the major weakness of existing models are the serious lack of specification and frequent use of data proxies; comparisons based on different time periods and different sets of assumptions. A need exists for a more rigorous approach to agricultural supply model building in developing countries, including the specification of a better theoretical framework and a more systematic empirical investigation, in order to make agricultural supply models comparable from country to country or area to area and from commodity to commodity.

IBRD-WP-023/GAA PC **A02**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Saving and Taxation in Developing Countries: An Empirical Study.
Staff working paper,
K. Krishamurty, and Dawn E. Elvis. Aug 68, 25p

Keywords: *Financial management, *Economic development, *Taxes, Savings, Consumption, Policies, Statistical analysis, Developing country application.

The aim of this statistical study is to investigate the relationships between taxation, private consumption, and savings. The author states that an increase in the savings-investment rate is one of the crucial factors in promoting economic development.

IBRD-WP-028/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Automobile Demand in Developing Countries.
Staff working paper,
Alexander G. Nowicki, and Suzanne M. Snell. Oct 68, 66p

Keywords: *Automobiles, *Economic analysis, Developing countries, Models, Forecasting, Developing country application, Developed countries.

This note reviews problems in projecting demand for automobiles in developed countries and gives examples of approaches to demand projection in some developing countries. It then proposes a new method of calculating demand in developing countries based on a growth and saturation model of the car market, and discusses how it could be used to formulate policy with respect to automobile manufacture.

IBRD-WP-029/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Optimum Number of Berths of a Port.
Staff working paper,
Jan de Weille, and Anandarup Ray. Nov 68, 50p

Keywords: *Ships, *Ports, Ship piers, Services, Cost analysis, Models, Developing country application.

This paper presents a method of specifying the relationship between the total waiting times of ships at a port and the number of ship arrivals, the number of berths and the average service time per ship. This relationship enables us to derive curves showing the variation in waiting time costs with different numbers of ship arrivals.

IBRD-WP-036/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Competitiveness of Capital Goods Industries in Selected Developing Countries.
Staff working paper,
Barend A. de Vries. Jan 69, 26p

Keywords: *Industrial development, Cost analysis, Policies, Developing country application.

This paper presents certain empirical data on industrial competitiveness in selected developing countries, based on studies undertaken in the World Bank. It discusses some of the implications of these findings for industrial policy and the 'orientation' of development, and makes suggestions for future research.

IBRD-WP-038/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Briefing Notes on Food Processing Industries in Developing Countries.
Staff working paper,
Helen Hughes. Feb 69, 94p

Keywords: *Food processing, Manufacturing, Exports, Problem solving, Developing country application.

This paper discusses the principal economic problems facing the food processing industries in developing countries. The main emphasis is on food processing for local consumption, but the prospects of increased processing for export are examined.

IBRD-WP-041/GAA PC **A02**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Analysis of Capital Flows between the Agricultural and Nonagricultural Sectors of West Pakistan.
Staff working paper,
Per Eklund. Apr 69, 19p

Keywords: *Pakistan, *Economic development, *Agriculture, Developing country application.

This paper analyzes the generation of savings from agricultural production in West Pakistan. It confirms the view that substantial transfers of private savings were and are being made out of the agricultural sector and briefly discusses the policy implications which follow.

IBRD-WP-042/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Analysis of Capital Flows between the Agricultural and Nonagricultural Sectors of India.
Staff working paper,
Emmerich M. Schebeck. Jun 69, 33p

Keywords: *India, *Economic development, *Agriculture, Developing country application.

The purpose of this study is to determine the direction and magnitude of capital flows between agricultural and non-agricultural sectors of India within the context of rising agricultural income, supplemented by subsidies, which almost entirely escape direct taxation.

IBRD-WP-046/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Project Appraisal in Inflationary Conditions.
Staff working paper,
Sanjaya Lall. Jun 69, 33p

Keywords: *Economic analysis, *Project evaluation, Economic conditions, Prices, Developing country application.

This paper discusses some general difficulties in project appraisal under inflationary conditions and how they might be overcome. It presents evidence of large fluctuations in relative prices apparently attributable to inflation.

IBRD-WP-047/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Shadow Prices for Project Evaluation in Less Developed Countries.
Staff working paper,
Richard S. Weckstein. Jun 69, 32p

Keywords: *Project appraisal, *Economic analysis, Developing country application.

This paper examines some fundamentally different processes used to develop shadow prices. The author cites the origins of these weaknesses as market imperfections such as the coexistence of unemployed labor and an artificially high labor wage, the power exerted by monopolies over prices, the existence of non-optimal income distribution and non-optimal purchasing power. The paper then rates some of the available synthetic 'shadow' prices.

IBRD-WP-051/GAA PC **A06**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Economic Aspects of the Pulp and Paper Industry, with Special Reference to Developing Countries.
Staff working paper,
Jose A. Datas-Panero. Oct 79, 103p

Keywords: *Paper industry, *Economic development, Characteristics, Developing country application.

The object of this paper is to provide background information on the pulp and paper industry to facilitate an understanding of the economic aspects which are relevant to establishment or expansion of the industry in developing countries.

IBRD-WP-056/GAA PC **A07**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Use of Simulation in Appraising a Livestock Breeding/Fattening Project.
Staff working paper,
Tariq Husain. Jan 70, 131p

Keywords: *Livestock, *Project evaluation, *Management planning, Models, Computer programming, Beef cattle, Developing country application.

The purpose of this paper is to illustrate the use of computer simulation in the appraisal of livestock projects, and to present one model for appraising a beef breeding/fattening project. A second objective is to develop a set of computer programs which may be used as computation tools in appraising livestock projects.

IBRD-WP-057/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Agricultural Production and Supply Response Research: A Review for Project Planners in Developing Countries.
Staff working paper,
James A. Seagraves. Jan 70, 71p

Keywords: *Project evaluation, *Research and development, *Management techniques, *Agricultural economics, Budgeting, Evaluation, Developing country application.

This paper reviews available research methodology and findings which would help resolve some questions raised by practitioners of development planning. It reviews estimation techniques allowing project planners and economists to more easily choose research methods. A brief review of the state of the art pertaining to agricultural production and supply functions is included, as are tables and references.

IBRD-WP-066/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Evaluation of Benefits from Season-to-Season Grain Storage Programs.
Staff working paper,
Shlomo Reutlinger, Norman Wilde, and Philip King. Feb 70, 54p

Keywords: *Project evaluation, *Grains(Food), Storage, Production, Consumption, Cost analysis, Developing country application.

This paper reports on progress of a study on planning and evaluation techniques for grain storage programs in developing countries. Storage demand and benefits, production, consumption and prices of grain in each season are shown to be jointly determined by the supply and demand functions for grain in each period, the variable storage costs, storage capacity and the amount of grain wasted during storage, given that storage is carried out with a view to maximizing benefits.

IBRD-WP-067/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Optimum Depth of Water in a Port.
Staff working paper,
Anandarup Ray. Feb 70, 80p

Keywords: *Ports, *Ships, Cost analysis, Cargoes, Developing country application.

This paper discusses the problems of cost benefit analyses of port deepening projects. It defines the relationship between the concepts of optimum vessel size and optimum shipment size and discusses how this relationship is affected by depth limitations in the port. The paper also presents some data on depth requirements for various vessel sizes and on vessel operating costs.

IBRD-WP-068/GAA PC **A02**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Are There Economies of Size in Government Current Expenditures in Developing Countries.
Staff working paper,
Ved P. Gandhi. Mar 70, 22p

Keywords: *Taxes, Government, Expenses, *Economic development, Developing country application.

This paper is the result of research done on the subject of the economies of 'size' in government current expenditures. It suggests, among other things, that a developing country is likely to consume almost the same proportion of its gross national product in government administration expenditures and civil consumption expenditures as its population and gross national product grow. Through an empirical investigation, the author concludes that there is a lack of economies of scale in government expenditures with respect to the size of the nation. Thus, no developing country should expect that there would be savings by virtue of the 'economies' in expenditure on government administration following the growth in its population or gross national product.

IBRD-WP-070/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Appraisal Methodology for Feeder Road Projects.
Staff working paper,
Arturo Israel. Mar 70, 71p

Keywords: *Financial management, *Roads, Access roads, Project planning, Models, *Regional planning, Developing country application.

This paper deals with the measurement of the benefits of feeder road investments in developing countries. It centers on two stages: project identification, and appraisal of specific investment alternatives. The paper also presents guidelines for carrying out a regional project identification survey and a parallel survey of institutional and sociological factors.

IBRD-WP-071/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Measurement of the Economic Benefits from Family Planning Projects and Programs.
Staff working paper,
Timothy King. Mar 70, 52p

Keywords: *Population control, *Cost benefits, Benefit cost analysis, Income, Developing country application, *Family planning.

This paper analyzes the main economic issues that arise in attempting to evaluate the results of family planning programs and projects. It discusses the validity of using the objective of maximizing national income per head as the criterion for measuring the economic benefits of such a project, and the way in which family planning projects lead to a rise in income per head.

IBRD-WP-073/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Framework for Urban Transport Studies.
Staff working paper,
Koichi Mera. Mar 70, 46p

Keywords: *Urban planning, *Transportation, Urban development, Models, Developing countries, Developing country application.

This paper presents a framework for urban transportation studies which could be adopted as part of a general urban development study for operational purposes as opposed to educational purposes. Such a study is designed to produce a long-range transportation investment program for an urban area and to identify and evaluate high priority transport projects to be undertaken in the immediate future.

IBRD-WP-074/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Concentration of Urbanization and Economic Efficiency.
Staff working paper,
Koichi Mera. Mar 70, 37p

Keywords: *Urban planning, *Productivity, Decentralization(Dispersal), Services, Income, Developing country application.

This paper examines the efficiency of large cities as opposed to medium-sized and smaller cities in the context of developing countries as well as developed countries.

IBRD-WP-076/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Economics of Rail Line Closure.
Staff working paper,
Ranjit K. Sau. May 70, 87p

Keywords: *Rail transportation, Stopping, *Economic analysis, Developing country application.

This paper discusses how to determine which sections of a rail system to close and when. These decisions are analyzed for both the economic (net social benefits) and financial (railway company's gains) objectives.

IBRD-WP-077/GAA PC **A09**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Systems Analysis of Rural Transportation.
Staff working paper.
May 70, 179p

Keywords: *Transportation, *Rural areas, Developing countries, *Economic analysis, Models, Developing country application.

This paper is the result of a systems analysis study of rural transportation. The emphasis is on the development of techniques for measuring the economic impact of alternative transport system investments (different feeder road grids).

IBRD-WP-083/GAA PC **A06**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Skilled-Manpower Demand Projections for Irrigation Projects in Northwest Mexico.
Staff working paper,
I. Haissman. Jun 70, 105p

Keywords: *Training, *Irrigation, Developing countries, Schools, *Mexico, Models, Developing country application.

This study gives a simple, practical method for calculating the skilled-manpower requirements of irrigation projects in developing countries and designing schooling systems for training of the necessary personnel. The study defines the occupations required in irrigation project development, shows in what activities each is deployed, and gives standards for manpower requirements as a function of the irrigated area, crop type, land tenure system, and other parameters.

IBRD-WP-091/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Investment Analysis in Electricity Supply.
Staff working paper,
Dennis Anderson. Nov 70, 97p

Keywords: *Electric power, *Financial management, Supply(Economics), Developing country application.

This study reviews, develops, and tests quantitative methods of appraising investments in electricity supply. Typical decision variables considered are: choice of fossil, nuclear, or single- or multi-purpose hydroplant; location of plant; directions of electrical energy transport; timing of investments; replacement; and, in all cases, the optimum mode of system operation.

IBRD-WP-094/GAA PC **A02**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Brazil Transport Study Models.
Staff working paper,
Clell G. Harral. Dec 70, 20p

Keywords: *Transportation, Models, *Brazil, Highways, Railroads, Water transportation, Developing country application.

This paper describes two applications of systems models to transportation planning problems in Brazil. The basic objective of the two studies is essentially the same-- transport project identification and preliminary evaluation for an entire mode or sector through application of a formal network model. The earlier study encompasses all modes (road, rail, and water) while the latter study is restricted to highways.

IBRD-WP-100/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Some Aspects of Public Education Expenditure in Africa.
Staff working paper,
Ved P. Gandhi. Feb 71, 36p

Keywords: *Education, *Africa, Instructors, Cost analysis, Developing country application.

This paper establishes the trends of high and rapidly growing education expenditures in Africa. It suggests, among other things, that the large number of expatriate teaching staff in the secondary (as well as higher) education institutions, high salaries and other pecuniary benefits given to these teachers, relatively low school enrollment ratios, and high teacher-pupil ratios in African countries perhaps account for the present 'costliness' of African education. It concludes that the 'underutilization' of such a costly resource as expatriate teachers in Africa must be thoroughly examined if some kind of 'optimization' of public education expenditure is to be immediately achieved in African countries.

IBRD-WP-103/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Son-Preference and Fertility Behavior.
Staff working paper,
Robert Repetto. Apr 71, 38p

Keywords: *Fertility, *Children, Males, Developing country application.

This paper tests the hypotheses that fertility behavior is influenced by the desire to have a particular ratio of sons to daughters. It is based upon survey data from developing countries in Asia and Africa. The author asserts that apart from a general preference for sons, this preference may be linked to economic conditions under which parents may have to rely on the support of surviving sons in their old age.

IBRD-WP-106/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Economic Effects of Various Methods of Educational Finance.
Staff working paper,
Daniel C. Rogers. May 71, 66p

Keywords: *Education, *Financial management, Fees, Students, Income, Taxes, Universities, Developing country application.

This paper offers a survey of the main methods of educational finance and analyzes their economic effects. These effects are examined against the background of various objectives, such as resource mobilization, equality, internal and external efficiency of education, etc. The general conclusion of the study is that any method of finance which does not either require an increase in general taxation or draw public resources away from other development tasks is desirable. In particular, fees, fees concerned with loans, and earmarked taxes are all methods of financing education worthy of careful consideration.

IBRD-WP-112/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Agricultural Development in Relation to the Employment Problem.
Staff working paper,
Shlomo Reutlinger, G. F. Donaldson, P. Duane, A. C. Egbert, and Tariq Husain. May 71, 72p

Keywords: *Farming, *Agriculture, *Employment, *Rural areas, Policies, Farms, Unemployment, Productivity, Developing country application.

This paper presents in a global context, a discussion of the rural employment problem and the policy issues that flow from it. The benefits and difficulties arising from the 'green revolution' are considered in the overall farm development scene. The policy requirements to facilitate the involvement of the unemployed and under-employed in the process of development are considered, as they relate to both the governments of developing countries and outside agencies.

IBRD-WP-118/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
International Comparison of Low Income in the Agricultural Sector in Selected LDC's.
Staff working paper,
Dipak Mazumdar. Oct 71, 28p

Keywords: *Income, *Farming, *Agriculture, *Rural areas, Developing country application.

This study develops a method for international comparison of income at particular points or ranges in income distributions, thereby permitting countries to be ranked, for example, by reference to the income position of the poorest groups. The method is applied to income and income distribution data relating to the rural populations of a number of less developed countries.

IBRD-WP-119/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Project Appraisal in Developing Countries.
Staff working paper,
Bela Balassa. Oct 71, 27p

Keywords: *Project evaluation, *Economic analysis, Return on investment, Foreign exchange rate, Developing country application.

In this paper, the author evaluates alternative methods of project appraisal in developing countries with a view to their practical application. In particular, comparisons are made between methods involving (a) the use of the rate of return to capital and the domestic cost of foreign exchange criteria; (b) the inclusion of direct as against indirect domestic costs in the calculations; and (c) the use of the shadow exchange rate and the Little-Mirrlees methods of valuing all goods at world market prices. Further consideration is given to the problems of project evaluation under alternative policy assumptions.

IBRD-WP-123/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
International Division of Labor: The Case of Industry.
Staff working paper,
Hollis Chenery, and Helen Hughes. Jan 72, 39p

Keywords: *International trade, *Economic development, *Industrial development, Developing country application.

This paper brings together recent currents of thought regarding the role of exports in the growth of manufacturing in developing countries. It relates patterns of industrial development to overall economic growth, and discusses the principal policy implications. It suggests that for both developing countries and industrialized nations, policy issues regarding industrial and related trade growth are likely to be key development problems in the future. Many tables and a bibliography are appended.

IBRD-WP-128/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Adjustments for Trade Distortions in Project Analysis.
Staff working paper,
Deepak Lal. Mar 72, 50p

Keywords: *Economic analysis, Commerce, *Project evaluation, Developing country application.

This paper sets out the nature of the adjustments which are required in project analysis in an economy with trade distortions. It shows the implicit or explicit assumptions alternative project selection procedures made about the adjustment processes and/or various structural features of the economy, and finally evaluates the practical usefulness of the alternative procedures.

IBRD-WP-129/GAA PC **A02**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Employment, Income Distribution and a Poverty Redressal Index.
Staff working paper,
Deepak Lal. Mar 72, 19p

Keywords: *Cost benefits, *Employment, *Income, Earnings, Cost benefit analysis, Distributing, Developing country application.

This paper argues that the aspect of the 'employment' problem not taken into account by the conventional efficiency 'shadow' wages used in social cost-benefit analysis is essentially distributional in nature. A poverty redressal index is then developed to take account of these distributional effects. It is a rough and ready measure which does not involve the specification of a full social utility function, and only requires very simple and probably generally acceptable value-judgements about income distribution.

IBRD-WP-130/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Estimating Income Distribution Weights for Project Analysis.
Staff working paper,
Deepak Lal. Mar 72, 43p

Keywords: *Economic analysis, *Income, *India, *Project evaluation, Developing country application.

This paper provides a method for deriving distributive weights based on a constant elasticity social utility function. This function integrated the three dimensions of income-distribution which may be relevant to project choice: the inter-temporal income distribution represented by the savings-consumption distribution of the net benefits of the projects; the inter-regional distributional effects dependent on the regional location of the project: and the intra-regional distribution of benefits as between recipients in different income groups in the region. Illustrative distributional weights are then derived for India.

IBRD-WP-137/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Evaluation of Family Planning Programs Using Service Statistics.
Staff working paper,
Roberto Cuca. Nov 72, 62p

Keywords: *Birth control, Evaluation, *Tunisia, Statistical analysis, Developing country application, *Family planning.

This paper presents a method of evaluation based upon statistics from the World Bank's family planning program and tries to evaluate the output of a family planning program in terms of births averted. The method provides a way of evaluating programs without the use of electronic data processing facilities; it can be used on a yearly or monthly basis, with only the assistance of a desk calculator. The paper includes an appendix in which the case of Tunisia has been taken to illustrate the methodology.

IBRD-WP-141/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Internal and External Aspects of Development Plans and Performance, 1960-1970.
Staff working paper,
Hollis B. Chenery, and Nicholas G. Carter. Feb 73, 55p

Keywords: *Economic development, Policies, Growth, Fixed investment, Developing country application.

This paper presents a summary evaluation of the interrelations between internal and external policies in the development experience of the 1960s, focusing on the needs of policy makers in both developing and developed countries. Growth rates are shown to have accelerated in most countries, and over the decade a number of aid recipients have gone through the anticipated sequence of increased investment rates, structural transformation, and declining aid requirements. Other countries have confirmed the suspicions of the aid skeptics and have shown little benefit from the assistance received.

IBRD-WP-152/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Nutrition and Health of Indonesian Construction Workers: Endurance and Anemia.
Staff working paper,
Darwin Karyadi, and Samir Basta. Apr 73, 59p

Keywords: *Health, *Nutrition, *Indonesia, Males, Nutritional deficiencies, Developing country application.

This paper describes a study of nutritional and health deficiencies in a sample of 571 male Indonesian construction workers. The study was undertaken to determine if dietary deficiencies or poor health were lowering workers' endurance as measured by the Harvard Step Test, and whether a nutrition intervention study was warranted.

IBRD-WP-157/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Financing of Education: An Examination of Basic Issues.
Staff working paper,
Jean-Pierre Jallade. Jul 73, 47p

Keywords: *Education, *Economic Analysis, Developing countries, Financing, Developing country application.

This paper treats a number of issues in the field of education finance. The escalating costs of education in recent years give these problems a special importance and urgency, particularly in less developed countries. The nature of education as a semi-public good together with its implications for finance, are discussed. The case for a mix of private and public finance for education is made, and its income distribution effects are considered.

IBRD-WP-159/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Micro-Economic Theories of Fertility.
Staff working paper,
Robert Repetto. Jul 73, 35p

Keywords: *Fertility, *Economic analysis, Family relations, Models, Developing country application.

This paper presents simple economic models of household behavior to clarify the normative and predictive implications of so-called economic theories of fertility. It also contains some new empirical tests of hypotheses derived from economic theories of fertility based on the existence of economic discrimination between populations.

IBRD-WP-162/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Automobiles and Cities: Strategies for Developing Countries.
Staff working paper,
Wilfred Owen. Sep 73, 29p

Keywords: *Automobiles, *Urban planning, Developing countries, Mass transportation, Recommendations, Developing country application.

This paper summarizes information immediately available on the problems of automobiles and their relation to mass transport in the cities of the developing countries. It is intended to serve as a basis for discussion of further research required in this field rather than to provide a comprehensive analysis of the wide variety of problems involved.

IBRD-WP-163/GAA PC **A02**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Fertility, Mortality and Population Growth: Interrelation and Policy Implications.
Staff working paper,
K. C. Zachariah, and G. Zafros. Sep 73, 19p

Keywords: *Fertility, Developing countries, Populations, Infants, Quality of life, Developing country application.

This paper examines the long-term implications of the interrelation between fertility and mortality rates for population programs in high mortality countries. In the long run most population mortality trends seem to assume a major role in determining the course of fertility trends after the mortality rate has declined to a relatively low level. It could be advantageous to concentrate on programs which include a strong component for the reduction of infant mortality. Such emphasis on mortality reduction is likely to accentuate some of the population problems in the short-run, but in the long run it should be highly beneficial, not only for improving the quality of life, but also for reducing the size of the total population.

IBRD-WP-164/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Protection and Development.
Staff working paper,
Helen Hughes. Oct 73, 27p

Keywords: *International trade, Imports, Government policies, Developing country application.

This paper summarizes the pros and cons of protection as an instrument of industrialization policy in developing countries. The paper argues that while there are strong arguments for moderate levels of protection as an instrument of industrialization, in the past many countries have used protection excessively with counterproductive economic and social effects.

IBRD-WP-165/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Alternative Strategies for Development.
Staff working paper,
Hollis B. Chenery, and Hazel Elkington. Oct 73, 99p

Keywords: *Economic development. *Industrial development, Developing country application.

This study defines a development strategy from comparisons of a country's structure of production and trade to the average intercountry patterns of resource allocation. On this basis, fifty developing countries are classified into four principal development strategies described as (i) Primary Specialization, (ii) Balanced Allocation, (iii) Import Substitution, and (iv) Industrial Specialization.

IBRD-WP-167/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Family Planning and Fertility Trends in Jamaica.
Staff working paper,
K. C. Zachariah. Nov 73, 34p

Keywords: *Fertility, *Jamaica, Trends, Surveys, Vital statistics, Developing country application, *Family planning.

This paper describes recent trends in fertility in Jamaica and examines the factors which are associated with them. The paper concludes that, although the current fertility rates in Jamaica are very much higher than those observed in the country during much of the period before 1950 when there was very little organized family planning effort, official or private, there has been a noticeable decline in the rates since the official program was launched.

IBRD-WP-168/GAA PC **A07**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Framework for the Promotion of Construction Industries in the Developing Countries.
Staff working paper,
John C. de Wilde, Marvin Gates, Nikolaus Werth, and Charles Cockburn. Nov 73, 131p

Keywords: *Construction, *Industrial development, Requirements, Economic development, Government, Banks(Buildings), Developing country application.

This report develops a framework for promoting the construction industry in the developing countries. The purpose of the report is to assist the World Bank by exploring the ways in which it can assist the development of domestic contracting industries.

IBRD-WP-169/GAA PC **A09**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Cost Effectiveness of Alternative Learning Technologies in Industrial Training: A Study of In-Plant Training and Vocational Schools.
Staff working paper,
Manuel Zymelman, M. Horowitz, E. Herrnstaft, and A. Woodruff. Dec 73, 195p

Keywords: *Training, *Industrial plants, Schools, Requirements, Vocational interests, Developing country application, On job training.

The purpose of this paper is to explore the circumstances under which in-plant training would be preferable to formal vocational schools in developing countries and to develop a methodology for the evaluation of vocational training schemes. A methodology for the evaluation of a vocational training scheme is developed and illustrated with the help of a numerical example.

IBRD-WP-170/GAA PC **A06**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Employment Implications of Industrialization in Developing Countries: A Survey.
Staff working paper,
David Morawetz. Jan 74, 114p

Keywords: *Employment, *Economic development, *Industrial development, Developing country application.

This paper is a survey of the post-1966 literature on the employment implications of industrialization in developing countries. Policies for augmenting employment in developing countries are discussed throughout the survey and suggestions for future research are presented.

IBRD-WP-175/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Iron Deficiency Anemia and the Productivity of Adult Males in Indonesia.
Staff working paper,
S. S. Basta, and A. Churchill. Apr 74, 57p

Keywords: *Nutrition, *Indonesia, *Productivity, Food habits, Nutritional deficiencies, Developing country application, Labor force.

This paper presents the results of investigations of the labor force in Indonesia and the high prevalence of iron deficiency anemia as a factor in labor productivity. To quantify the effects of anemia, a study was undertaken in which an attempt was made to correct this nutritional deficiency. The evidence presented here suggests that an increase in the consumption of some local foods, whose supply is plentiful, could lead to significant improvements in blood iron status. The paper includes a bibliography, tables and figures.

IBRD-WP-178/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Potential Distributive Effects of Nationalization Policies: The Economic Aspects.
Staff working paper,
Jorge Cauas, and Marcelo Selowsky. Apr 74, 47p

Keywords: *Economic analysis, Distribution systems, *Chile, Developing country application.

This paper analyzes the potential redistributive effects of a nationalization program of a given degree of confiscatory nature where the target is a subset of the (domestic) corporate sector of the economy. It examines the choices open to a government. The framework developed is afterwards evaluated with orders of the magnitude of the Chilean economy in the years 1971-72.

IBRD-WP-179/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC
Urban Land and Public Policy: Social Appropriation of Betterment.
Staff working paper,
Orville F. Grimes, Jr. May 74, 99p

Keywords: *Land use. *Urban planning, Policies, Government, Netherlands, Sweden, Singapore, South Korea, Taiwan, Developing country application.

This study investigates the economics of urban land value increments and examines the means by which socially induced land price increases are captured for public use. It is a conceptual and empirical analysis. Isolating reasons for the success or failure of specific policy measures can help provide guidelines for land use which are potentially applicable across a wide range of experience. An extensive bibliography is included.

IBRD-WP-180/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Quantitative Agricultural Planning Methodology.
Staff working paper,
Roger D. Norton, and Luz Maria Bassoco. May 74, 57p

Keywords: *Mexico, *Agriculture, Planning, Developing country application.

This paper describes the quantitative agricultural planning procedures used in Mexico as part of a national policy reformulation process. The procedures involved extensive use of the model Chac, developed in a joint DRC-Mexican government research project. In this paper, the operational version of the model is fully described and a rather complete set of applied results is presented with interpretations.

IBRD-WP-182/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Student Loans in Developing Countries: An Evaluation of the Colombian Experience.
Staff working paper,
Jean-Pierre Jallade. Jun 74, 77p

Keywords: *Colombia, *Education, Recommendations, Developing country application.

This paper is an assessment of the Colombian experience with student loans. The methodological approach is empirical. The author suggests improvements for the ICETEX program and outlines the lessons to be learned from the Colombian data which may be applicable elsewhere. Numerical tables are included as are samples of the loan application form and coding sheet.

IBRD-WP-183/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Fiscal/Financial Intervention, Factor Prices and Factor Proportions: A Review of the Issues.
Staff working paper,
Shankar N. Acharya. Aug 74, 97p

Keywords: *Financial management, Government policies, *Employment, Capital, Developing country application.

This paper reviews issues relating to the scope for fiscal and financial intervention in inducing economy-wide factor combinations with more employment per unit of capital. The scope for such intervention is limited by: (i) technological substitution possibilities within a sector or product, (ii) the possibilities for changing the output-mix in favor of labor-intensive products, (iii) responsiveness of producing units to price signals and (iv) the success of intervention policies in changing prevailing factor prices in the desired direction.

IBRD-WP-184/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Appraisal of Irrigation Projects and Related Policies and Investment.
Staff working paper,
Roger D. Norton, Luz Maria Bassoco, and Jose S. Silos. Aug 74, 37p

Keywords: *Irrigation, *Project evaluation, Prices, Developing country application.

This paper is a study of methods of handling interdependence in project appraisal. The kinds of interdependence analyzed are: (a) between investment projects and other policy instruments such as guaranteed prices, (b) among different types of investment projects, and (c) between local and sector-level decisions on investment outlays. The method of analysis is linear programming, and the paper is organized in terms of seven numerical examples of treating interdependence with this tool.

IBRD-WP-185/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Types of Economic Integration.
Staff working paper,
Bela Balassa. Sep 74, 28p

Keywords: *Regional planning, Commerce, *Economic development, Developing country application.

This paper evaluates the experience of developed market economies, socialist countries, and developing nations with regional (plurinational) integration schemes. The paper further considers the question of the optimal degree of market and of production-and-development integration as well as the relationship between economic integration and national sovereignty.

IBRD-WP-186/GAA PC **A06**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Economic Integration Among Developing Countries.
Staff working paper,
Bela Balassa, and Ardy Stoutjesdijk. Sep 74, 113p

Keywords: *Economic development, *Regional planning, Commerce, Developing country application.

This paper examines issues relating to economic integration in developing countries. It analyzes the benefits and costs of regional integration through trade liberalization as well as the project approach to integration.

IBRD-WP-187/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Toll Financing of Highways: Economic and Financial Considerations.
Staff working paper,
Nail Cengiz Yucel. 1974, 44p

Keywords: *Financial management, *Roads, Developing countries, Toll roads, Feasibility, Developing country application.

This paper examines toll financing of highways in terms of economic and financial considerations. It reviews and analyzes the experience of some toll using countries and draws conclusions on the feasibility and desirability of adopting toll financing of high standard highway networks in developing countries.

IBRD-WP-188/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Education, Poverty and Development.
Staff working paper,
John Simmons. Feb 74, 78p

Keywords: *Education, Effectiveness, Investments, Learning, Developing country application.

This paper reviews the major features of educational systems in developing countries, including investment; output; internal efficiency; benefits; and return on investment, employment and income distribution. Options for national strategies are discussed including dampening the social demand for schooling; increasing the economic relevance of alternative learning systems; and, compensating for the inequal effects of existing formal school systems.

IBRD-WP-191/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Financing the Development of Small Scale Industries.
Staff working paper,
D. Kochav, H. Bohlin, K. DiTullio, I. Roostal, and N. Wahl. Nov 74, 60p

Keywords: *Industrial development, *Financial management, Requirements, Problem solving, Developing countries, Developing country application.

This study distills the common elements needed to encourage small enterprises and presents measures to provide effective financial support of such enterprises. Based on field experience in 8 countries, the report summarizes the common financial problems present in smaller manufacturing enterprises and presents solutions for consideration by international development agencies willing to assist such enterprises.

IBRD-WP-195/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
African Experience with Rural Development: A Digest Report on the Africa Rural Development Study.
Staff working paper,
Rachel Weaving. Jan 75, 60p

Keywords: *Economic development, *Rural areas, *Africa, Income, Services, Productivity, Developing country application.

Planning for rural development in Africa has been hampered by lack of data and the lack of a framework of analysis which provides for the clear-cut identification of those constraints on productivity which pertain in specific areas, or to the prediction of responses to intervention. In order to build upon past experience, the African Rural Development Study undertook a series of reviews of rural development projects in Africa, with a view to evaluating the potential of different types of strategies under different conditions.

IBRD-WP-196/GAA PC **A10**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Investment in Education: National Strategy Options for Developing Countries.
Staff working paper,
John Simmons. Feb 75, 221p

Keywords: *Education, Government, Policies, Investments, Strategies, Developing country application.

This study is a collection of papers reviewing the main features of educational systems in developing countries and the investment issues. Options for national educational strategies are proposed.

IBRD-WP-197/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Rural-Urban Wage Gap, Migration and the Shadow Wage.
Staff working paper,
Dipak Mazumdar. Feb 75, 39p

Keywords: *Income, *Employment, *Rural areas, Developing countries, Population migrations, Developing country application.

This paper examines the theoretical issue of the shadow wage when the creation of an additional job in the urban sector with artificially elevated wages induces additional migration from the rural areas. The analysis treats two functions for defining the volume of rural-urban migration and two methods by which job seekers finance themselves during their period of search in the urban market.

IBRD-WP-198/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Theory of Urban Underemployment in Less Developed Countries.
Staff working paper,
Dipak Mazumdar. Feb 75, 45p

Keywords: *Employment, Models, Salaries, Developing country application.

This paper investigates the working model of an urban labor market in LDCs which has two sectors; one characterized by ease of entry, variable hours of work, and flexible earnings, the other by rigid wages maintained at a relatively high level.

IBRD-WP-200/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
How Effective Is Schooling in Promoting Learning. A Review of the Research.
Staff working paper,
John Simmons. Mar 75, 88p

Keywords: *Education, Effectiveness, Policies, Government, Developing country application.

This paper reviews the results of educational research in both developed and developing countries on the issue of schooling effectiveness and discusses the policy implications of its findings.

IBRD-WP-201/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Determinants of School Achievement in Developing Countries: The Educational Production Function.
Staff working paper,
Leigh Alexander, and John Simmons. Mar 75, 74p

Keywords: *Education, Policies, Government, Schools, Developing country application.

This paper reviews the literature on educational production functions for developing countries and suggests the policy implications. The paper includes tables, annexes, and a bibliography.

IBRD-WP-203/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Reforming the System of Incentives in Developing Countries.
Staff working paper,
Bela Balassa. Apr 75, 53p

Keywords: *Economic development, Tariffs, Resources, Employment, *Taxes, Exports, Developing country application.

This paper makes recommendations for reforming the system of incentives in countries which have established an industrial base behind high protective barriers. The recommendations aim at improving resource allocation and accelerating economic growth by removing or reducing distortions in factor and product markets.

IBRD-WP-206/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Cost Recovery Policies for Public Sector Projects.
Staff working paper,
Anandarup Ray. Jul 75, 49p

Keywords: *Financial management, *Cost benefits, *Taxes, Cost control, Policies, Developing country application.

This paper is a guide to the understanding of cost recovery issues, and to the preparation of consistent operational guidelines in individual sectors and subsectors.

IBRD-WP-210/GAA PC **A06**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Consequences of Farm Tractors in Pakistan: An Evaluation of IDA Credits for Financing the Mechanization.
Staff working paper,
John P. McInerny, and Graham F. Donaldson. Feb 75, 104p

Keywords: *Farming, *Pakistan, Tractors, Grants, Evaluation, Developing country application.

This study examines the major consequences of the introduction of tractor technology to farms in Pakistan. The assessment is based on information obtained from a survey of some 200 farms randomly selected from the 3868 which received tractors from the first credit in 1967-68.

IBRD-WP-211/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Urban Informal Sector.
Staff working paper,
Dipak Mazumdar. Jul 75, 61p

Keywords: *Urban plannng, *Employment, Earnings, *Productivity, Trends, Developing country application.

This paper debunks some of the conventional wisdom concerning the informal sector. The paper confronts the prediction of a dualistic urban labor market model for trends over time in output, employment, productivity, and earnings with the results of a case study of Peru by Richard Webb. A list of references and appendices on details of the model are provided.

IBRD-WP-214/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Agricultural Price Policy and Income Distribution in Low Income Nations.
Staff working paper,
John W. Mellor. Sep 75, 61p

Keywords: *Agriculture, Government policies, Income, Distribution systems, Developing country application.

This paper examines the distributional impact of changes in the relative price of food in low income countries. The analysis covers the impact on consumers arising from the different share of their budget allocated to food depending upon their level of income, and the impact on producers arising from the proportion of the output they market by various size farms.

IBRD-WP-215/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Internal Migration in Less Developed Countries: A Survey of the Literature.
Staff working paper,
Lorene Y. L. Yap. Sep 75, 54p

Keywords: *Migration, *Demography, Urban areas, Employment, Income, Developing country application.

The paper reviews the determinants of migration as discussed in the available econometric and other types of case studies. Migrants tend to move from places of low economic opportunity to areas of higher potential opportunities.

IBRD-WP-216/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Costing and Financing Education in LDCs: Current Issues.
Staff working paper,
Mats Hultin, and Jean-Pierre Jallade. May 75, 30p

Keywords: *Education, *Financial management, Income, Developing country application.

This paper reviews two different issues of concern to educational planners and policy-makers involved in the costing and financing of education. The first issue is the financial impossibility of continuing upward trends in educational costs. The second issue is that of education and income distribution.

IBRD-WP-218/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Policy Framework for Irrigation Water Charges.
Staff working paper,
Paul Duane. Jul 75, 58p

Keywords: *Cost benefits, *Financial management, *Irrigation, Decision making, Maintenance, Developing country application.

This paper is intended to assist decisions on cost recovery by providing an appropriate framework for determining the desirable means and degree of cost recovery. This paper includes annexes of statistics from irrigation projects.

IBRD-WP-224/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Public Works in Developing Countries: A Comparative Analysis.
Staff working paper,
S. J. Burki, D. G. Davies, R. H. Hook, J. W. Thomas, and R. V. Weaving. Feb 76, 88p

Keywords: *Project evaluation, Public utilities, *Employment, Low income groups, Quality of life, Developing country application.

This paper is a digest of a study of 24 public works programs in 14 countries. The potential of the public works instrument for absorbing unemployment, constructing needed physical facilities, and improving the living standards of low income groups is assessed. Unless public works are part of a coherent development strategy favoring productive employment, they can have only a minor impact on poverty and unemployment.

IBRD-WP-230/GAA PC **A06**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Travel Characteristics in Cities of Developing and Developed Countries.
Staff working paper,
Yacov Zahavi. Mar 76, 111p

Keywords: *Travel, Developing countries, Trends, Characteristics, Comparison, Developing country application.

The purpose of this paper is to compare travel characteristics in cities of developing and developed countries, in order to identify trends that are similar and isolate tendencies which are specific to each group. The paper is based on tables and graphical presentation of relationships with a minimum of supporting text.

IBRD-WP-231/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
'Effects Method' of Project Evaluation.
Staff working paper,
Bela Balassa. Mar 76, 30p

Keywords: *Project evaluation, Market value, Developing country application.

This paper critically evaluates the so-called 'effects method' of project appraisal, which involves valuing the product itself, as well as its direct and indirect imported inputs, at their shadow prices, which are equated to world market prices. The author makes recommendations for modifying the effects method by shadow pricing all primary factors and tradeable inputs. With these modifications, the effects method will become equivalent to the domestic resource cost and the internal rate of return methods which provide alternative expressions of the general economic profitability criterion.

IBRD-WP-233/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Unemployment, Labor Market Segmentation, the Opportunity Cost of Labor and the Social Returns to Education.
Staff working paper,
Sebastian Pinera, and Marcelo Selowsky. Jun 76, 53p

Keywords: *Education, Unemployment, *Employment, Developing country application.

This paper examines the discrepancy between the level of observed market wages and the true marginal product of labor classified by level of schooling in an urban economy.

IBRD-WP-235/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Distributive Effects of Local Government Finances in Colombia: A Review of the Evidence.
Staff working paper,
Johannes F. Linn. Mar 76, 61p

Keywords: *Financial management, *Colombia, *Taxes, Services, Public works, Developing country application.

This paper brings together scattered evidence available mainly in unpublished sources in order to assess the distributive impact of Colombian local government in four areas of fiscal policy: taxation, public expenditure, public service pricing, and access to public services.

IBRD-WP-236/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Some Effects of Commercial Policy on International Trade, the Location of Production, and Factor Movements.
Staff working paper,
Bela Balassa. Jun 76, 49p

Keywords: *International trade, *Economic analysis, Developing countries, Developing country application.

This paper examines the effects of commercial policy on international trade, the location of production, and factor movements in an international as well as an interregional context. The author analyzes the implications for developing country trade of tariff escalation in the developed, and protection in the developing countries. Calculations are also made to explain the effects of tariffs on imports and on industrial specialization in a group of 21 developed and developing countries.

IBRD-WP-237/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Income Distribution and the Economy of the Urban Household: The Case of Belo Horizonte.
Staff working paper,
Anna Maria Sant'Anna, Thomas W. Merrick, and Dipak Mazumdar. Jun 76, 68p

Keywords: *Income, *Brazil, Households, Earnings, *Employment, Developing country application.

This paper empirically examines the effects of household structure and related economic variables on urban poverty through the combined analyses of employment and earnings capacity of households at four levels of income.

IBRD-WP-238/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Export Subsidies by Developing Countries.
Staff working paper,

Bela Balassa, and Michael Sharpston. Jul 76, 51p

Keywords: *International trade, Attitudes, Developing country application.

This paper analyzes attitudes towards export subsidies granted by the developing countries, relying on available public information and on discussions with government officials and industrialists in major developing nations. It is prescriptive as it makes recommendations for policies by developing and developed countries and for modifying GATT rules in regard to export subsidization by developing countries.

IBRD-WP-243/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Economic Cost of the 'Internal' Brain Drain: Its Magnitude in Developing Countries.
Staff working paper,
Sebastian Pinera, and Marcelo Selowsky. Sep 76, 87p

Keywords: *Economic analysis, *Education, *Productivity, Developing countries, Income, Developing country application.

This paper examines the hypothesis of factor complementarity between (1) one's preschool ability and (2) education, in determining an individual's future productivity. The authors propose a framework in which educational resources are correlated to ability to produce the most positive impact and assert that the influence of factors such as family income in determining one's level of education cause a misallocation of educational resources.

IBRD-WP-244/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Should Developing Nations Carry Grain Reserves.
Staff working paper,
Shlomo Reutlinger, David Eaton, and David Bigman. Sep 76, 36p

Keywords: *Grains(Food), *Food supply, Investments, Developing country application.

This paper develops a method to simulate an investment in a grain reserve and calculate its efficiency, equity, trade, and stabilization impacts on a less developed nation. The method is applied to a hypothetical country engaged in limited importing when domestic harvests are poor and world grain prices are low.

IBRD-WP-245/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Stabilization, Adjustment and Diversification: A Study of the Weakest Commodities Produced by the Poorest Regions.
Staff working paper,
Dragoslav Avramovic. Nov 76, 66p

Keywords: *Agricultural economics, Developing country application.

This paper represents the results of an inquiry into the commodity problem faced by some of the poorest countries and regions in the world economy. It focuses on jute and hard fibers which have experienced a major loss of markets due to penetration of cheaper synthetics, irregular and insufficient supply, and recurring price fluctuations; and on tea which has suffered from a large and continuous price decline in real terms due to persistent surplus capacity and over-production.

IBRD-WP-246/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Patterns of Educational Expenditures.
Staff working paper,
Manual Zymelman. Nov 76, 88p

Keywords: *Education, *Financial management, Schools, Students, Cost analysis, Developing country application.

This paper presents data on educational expenditures of LDCs and OECD countries and compares patterns of allocation of these expenditures by levels of education. Expenditures at each level are also analyzed in terms of their three components: unit costs, enrollment rates, and the proportion of the school-age population in the total population.

IBRD-WP-248/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Export Incentives and Export Performance in Developing Countries: A Comparative Analysis.
Staff working paper,
Bela Balassa. Jan 77, 74p

Keywords: *International trade, Exports, Incentives, Developing country application.

This paper provides a comparative evaluation of export incentives and their effects on exports and economic performance in eleven developing countries classified in four groups, depending on the timing and extent of their export promotion efforts.

IBRD-WP-249/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Korea's Experience with Export-Led Industrial Development.
Staff working paper,
Larry E. Westphal. Feb 77, 94p

Keywords: *South Korea, *International trade, *Industrial development, Economic policy, Developing country application.

This paper is a summary of Korea's industrial development experience since the 1964/65 policy reforms. The author states that this performance has been striking with monetary and fiscal policy in increasing public and private savings playing an important role. Exports also have been a powerful engine of growth and, due to their labor intensity, they have contributed to the rapid expansion of productive employment and, indirectly, to the relatively even distribution of income. The paper includes relevant statistical tables and annexes.

IBRD-WP-251/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Perspective on the Foodgrain Situation in the Poorest Countries.
Staff working paper,
S. J. Burki, and T. J. Goering Apr 77, 58p

Keywords: *Food supply, *Grains(Food), Supply(Economics), Developing country application.

This paper gives a perspective on the availability of foodgrains in poor countries which takes account of short term fluctuations and also examines secular trends in production, trade and consumption. The author contends that without significant policy changes these countries' nominal foodgrain deficits are likely to triple between 1974 and 1985. The paper lays out in broad terms the strategies that seem most appropriate for increasing the availability of food in these countries, and estimates the additional domestic and foreign resource requirements necessary to meet output targets. Includes statistical tables and annexes.

IBRD-WP-252/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
City Size and National Spatial Strategies in Developing Countries.
Staff working paper,
Harry W. Richardson. Apr 77, 97p

Keywords: *Urban planning, *Economic development, Developing country application.

This report reviews current theories on urban size and economic activity, and then discusses the range of policy options which have been adopted and factors to be considered in making policy choices.

IBRD-WP-253-EN/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Economic and Social Analysis of Projects: A Case Study of Ivory Coast.
Staff working paper,
Johannes F. Linn. May 77, 78p

Keywords: *Economic analysis, *Project evaluation, *Ivory Coast, Benefit cost analysis, Developing country application.

After a brief introduction to the principles of economic and social analysis of projects, the study estimates shadow price parameters for the case of the Ivory Coast in order to evaluate the project from an 'efficiency' as well as 'social' point of view. The efficiency viewpoint takes no account of the distributive or growth implication of project selection, while the social viewpoint does so explicitly by introducing distributive weights for private costs and benefits.

IBRD-WP-253-FR/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Evaluation Economique et Sociale des Projets: Cas de la Cote d'Ivoire (Economic and Social Analysis of Projects: A Case Study of Ivory Coast).
Staff working paper,
Johannes F. Linn. May 77, 94p
Text in French.

Keywords: *Project evaluation, *Economic analysis, *Ivory Coast, Benefit cost analysis, Developing country application.

After a brief introduction to the principles of economic and social analysis of projects, the study estimates shadow price parameters for the case of the Ivory Coast in order to evaluate the project from an 'efficiency' as well as 'social' point of view. The efficiency viewpoint takes no account of the distributive or growth implication of project selection, while the social viewpoint does so explicitly by introducing distributive weights for private costs and benefits.

IBRD-WP-254/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Valorization Charges as a Method for Financing Urban Public Works: The Example of Bogota, Colombia.
Staff working paper,
William A. Doebele, and Orville F. Grimes, Jr. Mar 77, 92p

Keywords: *Urban planning, *Financial management, *Waste Disposal, *Taxes, Streets, Serves, *Colombia, Developing country application.

This paper provides an analysis of the financing of street improvement, sewer extensions and other urban services by valorization charges, a system of taxation by which the cost of these services is allocated to neighboring properties in proportion to benefits conferred. The experience of Bogota, Colombia, illustrates the impact of this system as a means of facilitating the provision of urban public services in developing countries at a rate nearly in line with urban growth.

IBRD-WP-255/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Employment Impact of Industrial Investment: A Preliminary Report.
Staff working paper,
Joseph J. Stern. Jun 77, 89p
Microfiche copies only.

Keywords: *Employment, *Industrial development, Unemployment, Developing countries, Developing country application.

This paper discusses conceptual issues and measurement techniques with respect to identifying the indirect effects of industrial investment. Greatest attention is devoted to the use of input-output analysis to estimate indirect employment as a result of forward and backward linkages from industrial investments. A list of references, statistical tables and appendices are included.

IBRD-WP-257/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.

Measuring the Performance of Family Planning Programs.
Staff working paper,
P. S. Mohapatra. Jun 77, 72p

Keywords: *Birth control, *Project evaluation, Objectives, Developing country application, Family planning.

The three essays in this document deal with the conceptual and practical problems of measuring the performance of family planning programs. They treat the subject from the separate viewpoints of managerial control and judging progress toward program goals. The essays are intended to provide administrators with a clear picture of the data system they need to evaluate programs and also for those in Research and Evaluation Units responsible for designing, maintaining, and presenting evaluation measures. Topics treated include: the definition of program objectives, the development of an operational plan and setting of targets for measuring achievement; the measurement of output, particularly on the trend analysis of acceptor data; and, utilization of service statistics.

IBRD-WP-258/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Multi-Level Programming and Development Policy.
Staff working paper,
Wilfred Candler, and Roger Norton. May 77, 56p

Keywords: *Economic development, *Mexico, *Agriculture, Developing country application.

This paper presents a new algorithm which enables the simultaneous treatment of two sub-problems of economic policy: the behavioral problems of forecasting the economy's reactions to policy changes and the policy problem of choosing among the alternative possible outcomes. It presents a modification of the simplex algorithm which permits the simultaneous operation of distinct objective functions. For illustrative purposes, the procedure is applied to a model of Mexican agriculture.

IBRD-WP-259/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Alternative Concepts of Marginal Cost for Public Utility Pricing: Problems of Application in the Water Supply Sector.
Staff working paper,
Robert J. Saunders, Jeremy J. Warford, and Patrick C. Mann. May 77, 89p

Keywords: *Economic analysis, *Sewage treatment, *Water supply, Prices, Sewers, Developing country application.

This paper discussed the rationale and problems of implementing marginal cost pricing for water supply and sewerage facilities. It examines several frequently used definitions of marginal cost. Using a number of assumptions about long-term trends in costs, output, and capital indivisibility, it evaluates each approach according to its implications for year-to-year price fluctuations, economic efficiency, and revenue generation.

IBRD-WP-263/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Industrial Policy and Development in Korea.
Staff working paper,
Larry E. Westphal, and Kwang Suk Kim. Aug 77, 75p

Keywords: *Economic development, *South Korea, *Industrial development, Developing country application, Economic policy.

This study is an examination of Korea's industrial incentive policies from 1955 to 1975. It begins with a brief history of Korea's industrial policies, followed by a discussion of historical trends in the real, effective exchange rates for exports and imports. Estimates of nominal and effective incentive rates for 1968 are then presented and analyzed in detail after which the changes that have taken place in the structure of Korea's trade and production are quantified and related to its industrial incentive policies. The essay concludes with a summary of the principal findings in the form of an evaluation of Korea's industrial development performance. It contains an extensive bibliography and tables.

IBRD-WP-264/GAA PC **A06**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Incidence of Urban Property Taxation in Developing Countries: A Theoretical and Empirical Analysis Applied to Colombia.
Staff working paper,
Johannes F. Linn. Aug 77, 116p

Keywords: *Taxes, *Colombia, Consumers, Real property.

This paper reviews and extends the theory of the incidence of urban property taxation in developing countries through a detailed quantitative analysis of property tax practices in Colombia.

IBRD-WP-265/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
India's Population Policy: History and Future.
Staff working paper,
Ravi Gulhati. Aug 77, 55p

Keywords: *Birth control, *India, Vital statistics, *Demography, Contraceptives, Low income groups, Developing country application, *Family planning.

This paper asserts that the Indian birth-rate has started declining as a result of socio-economic progress and the family planning effort. The paper includes an extensive bibliography.

IBRD-WP-266/GAA PC **A21**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Radio for Education and Development: Case Studies, Volume I and II.
Staff working paper,
Peter L. Spain, Dean T. Jamison, and Emile G. McAnany. May 77, 479p

Keywords: *Education, *Communication, Developing countries, *Honduras, Developing country application.

These volumes bring together a number of World Bank reports on their project experience using radio to stimulate educational and economic development. Papers included describe radio's use for in-school education, for formal education out-of-school, for non-formal education, for distance learning, and for interactive development communications. Most of the papers are case studies of project experiences.

IBRD-WP-267/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Food Insecurity: Magnitude and Remedies.
Staff working paper,
Shlomo Reutlinger. Jul 77, 43p

Keywords: *Food supply, *Grains(Food), Shortages, Consumption, Security, Developing country application.

This paper defines food insecurity as the probability of food grain consumption in developing countries falling below a desired level due to a fixed upper limit on the food import bill they can afford and an unfavorable combination of poor harvests and world food grain prices. The author suggests that a food import bill insurance scheme be used to attain security. Alternatively, security could be attained through a combination of a financial scheme and a grain buffer stock in or on behalf of the developing countries.

IBRD-WP-268/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Basic Education and Income Inequality in Brazil: The Long-Term View.
Staff working paper,
Jean-Pierre Jallade. Jun 77, 93p

Keywords: *Education, *Income, *Brazil, Government, Developing country application.

This paper treats the long-term impact of basic education on income inequality in Brazil. First it examines how investment in basic education affects income. Second, it assesses how much government financing of educational services and taxing of the returns to education investment help to achieve a more equitable distribution of income.

IBRD-WP-270/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Economic Fluctuations and Speed of Urbanization: A Case Study of Korea: 1955-75.
Staff working paper,
Bertrand Renaud. Nov 77, 55p

Keywords: *South Korea, *Economic development, *Urbanization, Urban development, Developing country application.

This paper tests the hypothesis that there can exist a well-defined quantitative relationship between the economic performance of an LDC economy and its speed of urbanization. A distributed-lag model based on the growth rate of the non-farm sector and the farm terms-of-trade explains over 80% of the variance of the annual migration rate over the period 1955-75. A bibliography and statistical calculations are provided.

IBRD-WP-271/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Nutritional and Economic Implications of Ascaris Infection in Kenya.
Staff working paper,
L. Latham, M. Latham, and S. S. Basta. Sep 77, 97p

Keywords: *Diseases, *Kenya, Children, Adults, Nematoda, *Nutrition, Developing country application.

This study, carried out in Kenya by a research team from Cornell University, was undertaken to determine the effect of Ascaris (roundworm infection) from both a nutritional and economic viewpoint. Although the results presented here largely pertain to children, their implications are equally valid to the well-being and productivity of adults.

IBRD-WP-273/GAA PC **A07**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Measurement of Spatial Differences in Poverty: The Case of Peru.
Staff working paper,
Vinod Thomas. Jan 78, 130p

Keywords: *Economic analysis, *Peru, Consumers, *Food, *Housing, Low income groups, Income, Developing country application.

This paper examines the implications of the spatial differences (i.e., those in living costs between different locations) for measures of poverty, and hence for the planning of anti-poverty programs. Taking Peru as an example, a method is described for measuring spatial differences in living costs, using regional consumer price indices. The proposed price index for items other than food is built up from household expenditure data.

IBRD-WP-276/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Model of Agricultural Production and Trade in Central America.
Staff working paper,
Roger Norton, Carlo Capri, Lehman Fletcher, Carlos Pomareda, and Molly Wainer. Apr 78, 94p

Keywords: *Central America, *Productivity, *Agricultural economics, Production, *Mexico, *Honduras, *Nicaragua, *Costa Rica, *Panama, *El Salvador, International trade, Developing country application.

This paper reports on an agricultural model for the five countries of Central America. Its structure is based on the earlier CHAC model for Mexico. The model describes production by crop and by three farm size groups for each country, food processing activities, international trade, consumption demands, and price formation. It is utilized primarily for purposes of assessing some of the benefits and costs of expanded agricultural trade, both within the region and with the rest of the world.

IBRD-WP-277/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Impact of Agricultural Price Policies on Demand and Supply, Incomes, and Imports: An Experimental Model for South Asia.
Staff working paper,
Marc Osterrieth, Eric Verreydt, and Jean Waelbroeck. Apr 78, 26p

Keywords: *Grains(Food), *Agricultural economics, *South Asia, Grains(Food), Food consumption, Food supply, Income, Developing country application.

This paper examines the impact of agricultural price policies on foodgrain production, consumption, and trade in South Asia. The approach is aggregate, based on a model which describes the whole of the economy of that subcontinent.

IBRD-WP-278/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Labor Market Segmentation and the Determination of Earnings: A Case Study.
Staff working paper,
Dipak Mazumdar, and Masood Ahmed. May 78, 45p

Keywords: *Income, *Malaysia, *Education, *Employment, Developing country application, Labor market.

This paper is an essay on the determination of the earnings of employees in urban Malaysia based on a sample survey carried out by the World Bank in three towns of Peninsular Malaysia in the second half of 1974. The main purpose is to assess the importance of institutional factors and to test a few widely held hypotheses about the role of labor market segmentation in determining the level of earnings in different sectors of the market.

IBRD-WP-280/GAA PC **A02**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Educational Effects of Class Size.
Staff working paper,
Wadi D. Haddad. Jun 78, 25p

Keywords: Instructors, *Education, Developing country application, Curricula.

This paper relates research results to the questions: Do pupils learn better in small or large classes. Do the educational benefits of small classes, if they exist, justify the additional cost. Is there an optimum class size that maximizes educational benefits and cost-effectiveness. On the basis of the reviewed studies, it cannot be concluded that an increase in class size will necessarily lead to a decrease in the level of academic achievements of pupils. What seems to be more important is what the teacher does with the opportunities provided by the size of the class.

IBRD-WP-283/GAA PC **A10**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Urban Land Policy Issues and Opportunities - Volume II.
Staff working paper,
Harold Dunkerley, A. Walters, J. Courtney, W. Boebele, and S. Shoup. May 78, 225p

Keywords: *Urban planning, *Land use, Developing countries, Developing country application, Ownership.

This paper brings together some important urban land issues now affecting developing countries in a series of supporting papers on individual aspects. These issues include the rapidity of rises in urban land prices, the potential and problems of capturing publicly created land values, and various developmental problems inherent in ownership and land use rights.

IBRD-WP-284/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Pakistan: Forestry Sector Survey.
Staff working paper,
S. A. Draper, J. Burley, A. J. Ewing, and G. Grayum. Jun 78, 62p

Keywords: *Forestry, *Pakistan, *Wood, Wood products, *Economic development, Resources, Demand(Economics), Developing country application.

This paper was undertaken as an integral part of a mission to assist the government of Pakistan and the World Bank with the preparation of forestry and forest industry projects suitable for external financing. It emphasises the crucial nature of Pakistan's forests to the economic activity of the country in maintaining an environmental balance in the agricultural sector, contributing a significant proportion of energy supply, and providing wood-based products. The study proposes strategy aimed at finding solutions to the problem of arresting the degradation of the forests and subsequently expanding the forest resource base.

IBRD-WP-286/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Shadow Pricing and Power Tariff Policy.
Staff working paper,
Mohan Munasinghe, and Jeremy J. Warford. Jun 78, 38p

Keywords: *Taxes, *Electric power, Cost analysis, Electric utilities, Developing country application.

This paper discusses the details of a two-step procedure designed to compensate for the effect of distortions on the electric power sector. It examines the computation of basic marginal costs by direct use of appropriate shadow prices to correct for readily quantifiable market distortions, considering the adjustment of such basic marginal costs to reflect other social and economic constraints.

IBRD-WP-287/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Wages, Capital Rental Values and Relative Factor Prices in Pakistan.
Staff working paper,
Stephen Guisinger. Jun 78, 54p

Keywords: *Pakistan, *Income, *Economic analysis, Salaries, Developing country application, Economic policy.

This paper is a study of the role played by factor prices, especially labor and capital, in shaping the economic structure of Pakistan. The price series used in this study for capital relate to only one type of capital, but the results are indicative of a very considerable distortion and suggest the price of capital may, in proportional terms, play a far greater role in skewing the wage-rental ratio from its equilibrium level than distortions in the price of labor.

IBRD-WP-288/GAA PC **A06**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Educational Reform in the Soviet Union: Implications for Developing Countries.
Staff working paper,
Irene Blumenthal, Charles Benson, and Sara Balderston. May 78, 113p

Keywords: *Education, *USSR, Specialized training, Counseling, Literacy, Government policies, Developing country application.

This paper examines the causes and consequences of educational reform in the Soviet Union and draws lessons for planners in developing countries who are confronted with similar issues. Recommendations for developing countries include: the use of general education as the basis for effective technical-professional training; the need to direct students toward areas of need; the importance of universal literacy; initial emphasis on primary education for all, and education for women; the value of nonformal education; and, state subsidies for high education.

IBRD-WP-294/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Economic Dimensions of Malnutrition in Young Children: A Survey of the Issues.
Staff working paper,
Marcelo Selowsky. Oct 78, 87p

Keywords: *Nutrition, Demography, Low income groups, *Children, Developing country application.

This paper is a review of the global magnitude and distribution of the calorie deficit. It derives the differential incidence of malnutrition in children using earlier estimates on the distribution of malnourished populations by income group in connection with income specific demographic data. From this data the author concludes that the association between malnutrition and poverty gives origin to a larger incidence of malnutrition among children. The author constructs a taxonomy of target oriented food programs.

IBRD-WP-295/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Technology of Rural Development.
Staff working paper,
John P. McInerney. Oct 78, 59p

Keywords: *Economic development, *Rural areas, Technology innovation, *Agriculture, Developing country application.

This paper examines the nature of technical innovation in rural development, the conditions required for successful innovation in agriculture, and the implications of these for development activities. While maintaining an economic perspective, the study reflects the conventional micro-economic framework for analyzing technology changes as being too restrictive, and argues for a more complete systems framework.

IBRD-WP-296/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Financial Cost of Agricultural Credit: A Case Study of the Indian Experience.
Staff working paper,
C. D. Datey. Oct 78, 78p

Keywords: *Agriculture, *Financial management, *India, Developing country application.

This study makes use of the limited data available in order to define the parameters of the financial costs of agricultural credit in India, and to make preliminary estimates of the costs.

IBRD-WP-297/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Agricultural Sector Planning Models: A Selected Summary and Critique.
Staff working paper,
A. C. Egbert. Oct 78, 74p

Keywords: *Agricultural economics, Developing country application.

This report provides a description and evaluation of seven selected Agricultural Sector Planning Models. The report includes a summary of some special concepts, which are considered useful in agricultural sector planning, and planning in general.

IBRD-WP-298-EN/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Textbooks and Achievement: What We Know.
Staff working paper,
Stephen P. Heyneman, Joseph P. Farrell, and Manuel A. Sepulveda-Stuardo. Oct 78, 45p

Keywords: *Education, Learning, Surveys, Reading, Developing country application.

The authors present a review of the published evidence from less industrialized societies on the relationship between textbooks available and academic achievement. The data used is from 12 countries. The authors conclude that the availability of books appears to be the most consistent school factor in predicting academic achievement, although their effect is far from uniform.

IBRD-WP-298-FR/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.

Les Manuels Scolaires et le Niveau Atteint par l'Eleve: Ce Que Nous Savons (Textbooks and Achievement: What We Know).
Staff working paper,
Stephen P. Heyneman, Joseph P. Farrell, and
Manuel A. Sepulveda-Stuardo. Oct 78, 48p
Text in French.

Keywords: *Education, Learning, Surveys, Reading, Developing country application.

The authors present a review of the published evidence from less industrialized societies on the relationship between textbooks available and academic achievement. The data used is from 12 countries. The authors conclude that the investment in reading materials results more often in improved education than do other pedagogical variables.

IBRD-WP-298-SP/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Los Textos Escolares y el Rendimiento Academico: Lo Que Sabemos (Textbooks and Achievement: What We Know).
Staff working paper,
Stephen P. Heyneman, Joseph P. Farrell, and
Manuel A. Sepulveda-Stuardo. Oct 78, 70p
Text in Spanish.

Keywords: *Education, Learning, Surveys, Reading, Developing country application.

The authors present a review of the published evidence from less industrialized societies on the relationship between textbooks available and academic achievement. The data used is from 12 countries. The authors conclude that the availability of books appears to be the most consistent school factor in predicting academic achievement, although their effect is far from uniform.

IBRD-WP-300/GAA PC **A07**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Two Studies of Development in Sub-Saharan Africa.
Staff working paper,
Shankar N. Acharya, and Bruce Johnston. Oct 78, 137p

Keywords: *Economic development, *Africa, Developing country application.

The study analyses the developmental conditions faced by post-colonial African nations, outlines alternative development strategies followed by different groups of countries, and assesses the consequences for growth and poverty alleviation. The paper then outlines policy priorities for the future.

LBL-9642/GAA PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Projects from Federal Region IX: DOE Appropriate Energy Technology Pilot Program. Part I.
C. W. Case, F. B. Lucarelli, J. Morris, and H. R. Clark. Aug 79, 42p
Contract W-7405-ENG-48

Keywords: *Research and development, Arizona, California, Federal assistance programs, Grants, Hawaii, Nevada, Solar energy, ERDA/290500.

Some pilot programs for appropriate technology projects within Federal Region IX with information on technical and economic data are assembled. In Arizona, the following programs are included: concept testing of an energy management system; solar air active heater/passive cooler collector system; hardware package and workshop curriculum for residential solar hot water systems; Project SAW - solar, adobe, wind; Solar/Adobe Project. The following programs are being conducted in California - two stage evaporative cooler, lompico logs, solar process heating for a bottle-sterilizing plant, solar/woodstove domestic water heating systems, solar-heated greenhouses, and remote-location wind electric system. A small farm and homestead anaerobic digester program is in progress in Hawaii. In Nevada, the following have been funded: solar heating for a rural firehouse; Pyramid Lake solar-assisted fish hatchery; and agua caliente. The following programs in the Western Pacific are being conducted: Satawan health dispensary solar hot water system, Western Pacific solar hot water construction and demonstration, and fishmeal from solar-heated driers. (ERA citation 05:003169)

N82-11278/0/GAA PC **A02**/MF **A01**
South African Bureau of Standards, Pretoria.
Standard Specification for Industrial Safety-Belt Assemblies.
5 Nov 80, 20p SABS-809-1980, ISBN-0-626-05710-8
In English and Afrikaans.

Keywords: *Occupational safety and health, *Safety, *Industrial plants, Acceptability, Corrosion tests, Drop tests, Inspection, Packaging, Rivets, Sewing, Tensile tests.

Specifications are given for the general design, material, construction, and performance requirements for four types of industrial safety belts: (1) a waist belt; (2) a combination of a waist belt and shoulder, 11 leg, and back straps; (3) a combination of a waist belt and shoulder and back straps. Inspection procedures and test sequences are included with drawings.

N82-11858/9/GAA PC**$7.50**/MF**$3.00**
Bionetics Corp., Hampton, VA.
Handbook for Industrial Noise Control.
1981, 139p NASA-SP-5108
Contract NAS1-15721

Keywords: *Occupational safety and health, *Safety, *Industrial plants, Technology utilization, Aeroacoustics, Auditory defects, Exposure, Handbooks, Noise generators, Noise pollution, Vibration damping.

The basic principles of sound, measuring techniques, and instrumentation associated with general purpose noise control are discussed. Means for identifying and characterizing a noise problem so that subsequent work may provide the most efficient and cost effective solution are outlined. A methodology for choosing appropriate noise control materials and the proper implementation of control procedures is detailed. The most significant NASA sponsored contributions to the state of the art development of optimum noise control technologies are described including cases in which aeroacoustics and related research have shed some light on ways of reducing noise generation at its source.

N82-15769/4/GAA PC **A07**/MF **A01**
Research Triangle Inst., Research Triangle Park, NC.
Applications of Aerospace Technology in Biology and Medicine.
H. C. Beall, R. L. Beadles, J. N. Brown, Jr., W. H. Clingman, and M. W. Courtney. Jul 79, 128p NASA-CR-159106, RTI/1411/00-05F
Contract NAS1-14708

Keywords: *Health, *Technology transfer, Technology utilization, Biomedical data, Information flow, Medical equipment, Medical science, Research and development.

Medical products utilizing and incorporating aerospace technology were studied. A bipolar donor-recipient model for medical transfer is presented. The model is designed to: (1) identify medical problems and aerospace technology which constitute opportunities for successful medical products; (2) obtain early participation of industry in the transfer process; and (3) obtain acceptance by medical community of new medical products based on aerospace technology.

N82-16487/2/GAA PC **A11**/MF **A01**
Honeywell Corporate Material Sciences Center, Bloomington, MN.
Silicon-on Ceramic Process: Silicon Sheet Growth and Device Development for the Large-Area Silicon Sheet Task of the Low-Cost Solar Array Project.
Final Report.
B. L. Grung, J. D. Heaps, F. M. Schmit, S. B. Schuldt, and J. D. Zook. 3 Mar 81, 239p NASA-CR-163476, DOE/JPL-954356-80/15
Contract JPL-954356
Sponsored in Part by Doe Prepared for JPL.

Keywords: *Ceramics, Directional solidification(Crystals), Menisci, Product development.

The technical feasibility of producing solar-cell-quality sheet silicon to meet the Department of Energy (DOE) 1986 overall price goal of $0.70/watt was investigated. With the silicon-on-ceramic (SOC) approach, a low-cost ceramic substrate is coated with large-grain polycrystalline silicon by unidirectional solidification of molten silicon. This effort was divided into several areas of investigation in order to most efficiently meet the goals of the program. These areas include: (1) dip-coating; (2) continuous coating designated SCIM-coating, and acronym for Silicon Coating by an Inverted Meniscus (SCIM); (3) material characterization; (4) cell fabrication and evaluation; and (5) theoretical analysis. Both coating approaches were successful in producing thin layers of large grain, solar-cell-quality silicon. The dip-coating approach was initially investigated and considerable effort was given to this technique. The SCIM technique was adopted because of its scale-up potential and its capability to produce more conveniently large areas of SOC.

N82-22343/9/GAA PC **A07**/MF **A01**
Eagle Engineering, Inc., Houston, TX.
Study on Application of Aerospace Technology to Improve Surgical Implants.
Final Report.
R. E. Johnson, and J. L. Youngblood. Mar 82, 139p
NASA-CR-165868, NAS 1.26:165868
Contract NAS1-16567

Keywords: *Health, *Technology transfer, Finite element method, Fracture mechanics, Stress analysis, Structural design criteria, Technology assessment, Yield strength.

The areas where aerospace technology could be used to improve the reliability and performance of metallic, orthopedic implants was assessed. Specifically, comparisons were made of material controls, design approaches, analytical methods and inspection approaches being used in the implant industry with hardware for the aerospace industries. Several areas for possible improvement were noted such as increased use of finite element stress analysis and fracture control programs on devices where the needs exist for maximum reliability and high structural performance.

N82-24301/5/GAA PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Standard Tests for Toughened Resin Composites.
May 82, 29p L-15317, NAS-1.61-1092, NASA-RP-1092

Keywords: *Plastics, Compression tests, Impact tests, Ply orientation, Standards, Thickness ratio.

Several toughened resin systems are evaluated to achieve commonality for certain kinds of tests used to characterize toughened resin composites. Specifications for five tests were standardized; these test standards are described.

N82-28206/2/GAA PC **A04**/MF **A01**
Council for Scientific and Industrial Research, Pretoria (South Africa).
Mini-Seminar on Approaches to Productivity Improvement.
Aug 81, 70p ISBN-0-7988-2082-9

Keywords: *Management techniques, *Productivity, Management methods, Motivation, Scheduling.

Management of administrative productivity is addressed. Improving productivity through routing and scheduling is discussed. Storage of merchandise is considered. Rationalization is considered. Management motivation is also considered.

N82-29720/1/GAA PC **A04**/MF **A01**
DHR, Inc., Washington, DC.
Application of Photovoltaic Electric Power to the Rural Education/Communication Needs of Developing Countries.
Final Report.
A. Cabraal, D. Delansanta, and G. Burrill. Jul 82, 61p
NASA-CR-167894, NAS 1.26:167894
Contract DEN3-248
Prepared in Cooperation with Associates in Rural Development, Inc., Burlington, VT. Sponsored in Part by Agency for International Development.

Keywords: *Photovoltaic power system, *Electric power, *Communication, *Education, Medical services, Rural areas, User requirements.

The suitability (i.e., cost competitiveness and reliability) of photovoltaic (PV) power systems for rural applications in developing countries is considered. Potential application sectors include health delivery, education and communication where small amounts of electricity are needed to meet critical needs.

N82-29864/7/GAA PC **A03**/MF **A01**
Canada Inst. for Scientific and Technical Information, Ottawa (Ontario).
Utilization of Macromolecules in Blood Purification Systems.
K. Takakura, and T. Nakashima. 1982, 31p NRC/CNR-TT-2021, ISSN-0077-5606
Transl. Into English from Kagaku Zokan (Japan), No. 84, 1980 p 141-152.

Keywords: *Health, Acrylic resins, Bioengineering, Ethylene compounds, Medical equipment, Translations.

The macromolecular membranes and adsorbents that play essential roles in blood purification sytems, as well as materials that are used to coat the adsorbents, are discussed. The KF 101 dialyzer employs hollow fibers made of an ethylene-vinyl alcohol copolymer (EVA). The DHP-1 blood purifier utilizes activated charcoal coated with hydroxyethyl methacrylate (HEMA). These macromolecules are discussed from the standpoint of their medical utility.

N82-31159/8/GAA PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Role of the Developing Nations in the Development and Optimal Use of Space Technology.
M. S. Pena. May 82, 11p NAS 1.15:76896, NASA-TM-76896
Contract NASW-3541
Transl. Into English of "Rol de Los Paises en Desarrollo en El Dearollo Y Optima Utilizacion de la Technologie Especial" Argentina, 1982 9 p. Transl. By Kanner (Leo) Associates, Redwood City, Calif. Original DOC. Prep. By National Commission of Space Research, Argentina. Presented at the United Nations Reg. Seminar on Space Appl., 1982.

Keywords: *Economic analysis, *Telecommunications, *Technology assessment, Personnel, Remote sensing, Training analysis, Translations.

The economic and social factors are discussed which play a role in the advancement of space technology in developing nations. It is concluded that mutual collaboration between developed and developing nations is the basic element which will allow developing nations to take part in space experiments and research.

N82-31792/6/GAA PC **A04**/MF **A01**
Roskilde Universitetscenter (Denmark). Inst. for Studiet af Matematik og Fysik Samt Deres Functioner i Undervisning, Forskning og Anvendelser.
Planning and Policy Considerations Related to the Introduction of Renewable Energy Sources into Energy Supply Systems. Energy Series No. 3.
B. Sorensen. Jan 81, 59p DE82-900828, TEKST-41

Keywords: *Renewable energy, *Technology assessment, Biomass energy production, Comparison, Economic analysis, Environment effects, Finance, Geothermal resources, Social factors, Solar energy conversion, Windpower utilization.

Elements of a methodology for long term energy planning with particular reference to the introduction of renewable energy technologies, and a methodology for comparative assessment of energy systems are discussed. The discussion comprises technical and economic viability, indirect economy, environmental and social impacts, as well as the influence of uncertainty on the assessment. The role of renewable energy in future energy supply systems is discussed, with separate treatment of the situation in developing countries and in highly industrialized countries. Finally, mechanisms for the mobilization of technical and financial requirements are touched upon.

N82-33276/8/GAA PC **A02**/MF **A01**
EASAMS, Camberley (England).
Reliability, Availability Maintainability, Planning for Project Development.
J. F. Lee. 1981, 12p REPT-92
Presented at Marconi 81 Symp., 24 Jun. 1981.

Keywords: *Management techniques, *Management planning, *Project planning, *Maintenance, Management methods, Operations research, Performance prediction, Reliability analysis, Research and development.

A reliability and maintenance (RM) plan which can be adapted by customers and contractors to any project is presented. Individual/group responsabilities, procedures, and documentation are outlined. The plan includes independent maintenance support systems and operational systems. This approach allows the additional, RM requirements of the maintenance subsystem to be met, without confusing the operational system RM program.

N82-33828/6/GAA PC **A06**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Design Description of the Tangaye Village Photovoltaic Power System.
J. E. Martz, and A. F. Ratajczak. Jun 82, 113p NAS 1.15:82917, E-1305, NASA-TM-82917

Keywords: *Photovoltaic power system, *Solar energy, *Economic development, *Rural areas, Electric power plants, International cooperation, Upper volta.

The engineering design of a stand alone photovoltaic (PV) powered grain mill and water pump for the village of Tangaye, Upper Volta is described. The socioeconomic effects of reducing the time required by women in rural areas for drawing water and grinding grain were studied. The suitability of photovoltaic technology for use in rural areas by people of limited technical training was demonstrated. The PV system consists of a 1.8-kW (peak) solar cell array, 540 ampere hours of battery storage, instrumentation, automatic controls, and a data collection and storage system. The PV system is situated near an improved village well and supplies d.c. power to a grain mill and a water pump. The array is located in a fenced area and the mill, battery, instruments, controls, and data system are in a mill building. A water storage tank is located near the well. The system employs automatic controls which provide battery charge regulation and system over and under voltage protection. This report includes descriptions of the engineering design of the system and of the load that it serves; a discussion of PV array and battery sizing methodology; descriptions of the mechanical and electrical designs including the array, battery, controls, and instrumentation; and a discussion of the safety features. The system became operational on March 1, 1979.

N82-33981/3/GAA PC **A02**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Assessment of PERT as a Technique for Schedule Planning and Control.
C. W. Sibbers. Jul 82, 21p NAS 1.15:83265, NASA-TM-83265

Keywords: *Management planning, *Computers, *Management techniques, Computer techniques, Documentation, Management planning, Project management.

The PERT technique including the types of reports which can be computer generated using the NASA/LaRC PPARS System is described. An assessment is made of the effectiveness of PERT on various types of efforts as well as for specific purposes, namely, schedule planning, schedule analysis, schedule control, monitoring contractor schedule performance, and management reporting. This assessment is based primarily on the author's knowledge of the usage of PERT by NASA/LaRC personnel since the early 1960's. Both strengths and weaknesses of the technique for various applications are discussed. It is intended to serve as a reference guide for personnel performing project planning and control functions and technical personnel whose responsibilities either include schedule planning and control or require a general knowledge of the subject.

N82-34101/7/GAA PC **A03**/MF **A01**
Canada Inst. for Scientific and Technical Information, Ottawa (Ontario).
Computer-Aided Design, Drawing and Manufacturing System for Dies and Molds.
T. Mori, and M. Yasuda. 1982, 47p NRC/CNR-TT-2030, ISSN-0077-5606
Trans. Into English from Natl. Tech. Rept. (Matsushita Elec. Ind. Co., Osaka), V. 24, No. 6, 1978 p 1046-1056.

Keywords: *Machine tools, *Computers, Computer graphics, Efficiency, Engineering drawings, Productivity, Translations.

A computer-aided system for designing, drawing, and manufacturing molds and dies and for conducting control operations was developed. This system makes it possible to save labor and shorten the delivery time for molds and dies by making operations simpler and more flexible, resulting in increased efficiency in the design, manufacturing and control phases of production. Features that assist in the design, drawing and numerically controlled machining of these types of molds and dies are emphasized.

N83-10368/9/GAA PC **A06**/MF **A01**
Siemens A.G., Berlin (Germany, F.R.).
Fundamental Research into High Voltages for Further Development of Electric Power Distribution Systems.
Final Report, Dec. 1980.
E. Gockenbach, W. Buch, M. Crucius, A. Diessner, and H. Luehrmann. May 82, 111p BMFT-FB-T-82-064, ISSN-0340-7608
Sponsored by Bundesministerium fuer Forschung und Technologie.

Keywords: *Electric power, *Research and development, Electrical faults, Gas discharges, Networks.

In order to guarantee correct electric power distribution, the use of voltages between 765 and 1200 kV was investigated. This fundamental research was conducted in an 1800 kV outdoor test station. After describing the connection and protection devices of the three stage high voltage generating transformer, and the tested equipment which has to withstand humidity, rain, dirt accumulation, snow, ice, and wind, the recording equipment and the transient measurements which result from breakdowns in the SF6 gas insulated equipment and from flashovers in long air gaps, are presented. To limit the effects of high voltage oscillation, damping resistance and short cicuiting equipment on the primary side of the transformers were used. In this way, the overvoltages were prevented from rising to dangerous levels.

N83-11578/2/GAA PC **A03**/MF **A01**
National Building Research Inst., Pretoria (South Africa).
Prediction of the Thermal Performance of Building by the CR-Method.
J. D. Wentzel, R. J. Page-shipp, and J. A. Venter. 1981, 26p CSIR-BRR-396, ISBN-0-7988-2047-0

Keywords: *Project evaluation, *Buildings, *Heat transfer, Amplitudes, Devoloping nations, Ratios, Thermal energy.

A method for predicting the hottest and coldest likely indoor conditions in a house, given the materials of construction, general design details and layout is described. The procedure is based on an analysis of many measured values and thus requires no experimental verification. Although the calculation procedure, which is fully analyzed and illustrated by means of an example, is fairly complex, it requires no knowledge of advanced mathematics and all calculations can be done on a hand calculator. The procedure is not meant to replace sophisticated building energy and thermal performance prediction computer programs but is aimed at users who do not have computer facilities but nevertheless wish to assess the likely thermal performance of different structures. The product of heat storage capacity (C) and weighted or equivalent resistance to heat flow (R) comprise one prediction method. The procedure assumes reasonable provision of cross-ventilation and also that windows are shaded to prevent direct sun penetration in summer.

N83-13585/5/GAA PC **A05**/MF **A01**
DHR, Inc., Washington, DC.

Market Assessment of Photovoltaic Power Systems for Agricultural Applications Worldwide.
Final Report.
A. Cabraal, D. Delasanta, J. Rosen, J. Nolfi, and R. Ulmer. Nov 81, 89p NAS 1.26:165541, DOE/NASA/0180-6, NASA-CR-165541
Contracts DEN3-180, DE-AI01-79ET-20485

Keywords: *Agriculture, *Photovoltaic power system, *Economic development, Product development, Rural areas, Technology assessment.

Agricultural sector PV market assessments conducted in the Phillippines, Nigeria, Mexico, Morocco, and Colombia are extrapolated worldwide. The types of applications evaluated are those requiring less than 15 kW of power and operate in a stand alone mode. The major conclusions were as follows: PV will be competitive in applications requiring 2 to 3 kW of power prior to 1983; by 1986 PV system competitiveness will extend to applications requiring 4 to 6 kW of power, due to capital constraints, the private sector market may be restricted to applications requiring less than about 2 kW of power; the ultimate purchase of larger systems will be governments, either through direct purchase or loans from development banks. Though fragmented, a significant agriculture sector market for PV exists; however, the market for PV in telecommunications, signalling, rural services, and TV will be larger. Major market related factors influencing the potential for U.S. PV Sales are: lack of awareness; high first costs; shortage of long term capital; competition from German, French and Japanese companies who have government support; and low fuel prices in capital surplus countries. Strategies that may aid in overcoming some of these problems are: setting up of a trade association aimed at overcoming problems due to lack of awareness, innovative financing schemes such as lease arrangements, and designing products to match current user needs as opposed to attempting to change consumer behavior.

N83-15173/8/GAA PC **A06**/MF **A01**
International Development Research Centre, Ottawa (Ontario).
International Cooperative Information Systems.
1980, 111p IDRC-156E
In French and English.

Keywords: *Computers, *Information systems, Information dissemination, Social factors.

Developing countries need mechanisms by which the information they generate themselves and development information from the rest of the world can be retrieved. The international cooperative information system is such a mechanism. Delegates to the Seminar on International Cooperative Information Systems were informed about various existing systems (INIS, AGRIS, INFOTERRA, TCDC/INRES, POPIN, DEVSIS, and INPADROC), some specialized information systems and services (CDS/ISIS and the Cassava Information Centre), and computer programs for information processing (INIS/AGRIS, CDS/ISIS, and MINISIS). The participants suggested some changes that should be made on both the national and the international levels to ensure that these systems meet the needs of developing countries more effectively.

N83-15407/0/GAA PC **A02**/MF **A01**
UKAEA Atomic Energy Research Establishment, Harwell (England). Materials Development Div.
Automated Electrochemical Test Facility.
C. Westcott, G. P. Marsh, and D. E. Williams. Feb 82, 15p AERE-R-10361

Keywords: *Chemical industry, *Electric power, *Industrial plants, Chemical tests, Electrolysis, Research facilities, Systems engineering.

The design and operation of an automated electrochemical test facility is described. By careful choice of components the construction of special interfaces was avoided and a flexible and inexpensive system, easy to install and operate, was obtained. Applications of the system are indicated and examples discussed.

N83-19223/7/GAA PC **A05**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Survey of Manufacturers of Solar Thermal Energy Systems.
N. Levine, and M. Slonski. Aug 82, 100p NAS 1.26:169924, JPL-PUB-82-94, NASA-CR-169924
Sponsored by NASA and Doe.

Keywords: *Industrial plants, *Research and development, *Solar thermal power plants, Governments, Marketing, Risk.

Sixty-seven firms that had received funding for development of solar thermal energy systems (STES) were surveyed. The effect of the solar thermal technology systems program in accelerating (STES) were assessed. The 54 firms still developing STES were grouped into a production typology comparing the three major technologies with three basic functions. It was discovered that large and small firms were developing primarily central receiver systems, but also typically worked on more than one technology. Most medium-sized firms worked only on distributed systems. Federal support of STES was perceived as necessary to allow producers to take otherwise unacceptable risks. Approximately half of the respondents would drop out of STES if support were terminated, including a disproportionate number of medium-sized firms. A differentiated view of the technology, taking into account differing firm sizes and the various stages of technology development, was suggested for policy and planning purposes.

N83-21141/7/GAA PC **A11**/MF **A01**
Centre Technique des Industries Mecaniques, Nantes (France).
Outlook for Plastic Materials, Elastomeres Paints. Reports of Visits Prospective Matieres Plastiques - Elastomers - Peintures (Rapport de Visites). Premiere Partie: Matieres Plastiques.
M. Bord. Jul 81, 244p CETIM-12-B-194
Partly in French and English.

Keywords: *Chemical industry, *Plastics, Bearings, Electrical insulation, Extruding, Impact resistance, Injection molding, Thermal expansion.

Torlon is a poly(amide-imide) resin, developed especially for applications previously thought too severe for general polymers. Torlon molding resins provide exceptional strength and thermal resistance. They can be fabricated into high performance components capable of maintaining their structural integrity in continuous use in temperature environments of up to 260 C (500 F) and under extreme load bearing conditions. Using conventional high volume processing techniques, Torlon can be injection molded into complex, precision parts, or extruded and machined to extremely close tolerances all at a comparatively low cost.

N83-22439/4/GAA PC **A07**/MF **A01**
Science Applications, Inc., Chatsworth, CA. Combustion Science and Advanced Technology Dept.
Review of Alternative Fuels Data Bases.
Final Report.
P. T. Harsha, and R. B. Edelman. Jan 83, 130p NAS 1.26:170203, SAI-83-045-CHA, NASA-CR-170203

Keywords: *Fuels, *Chemical industry, Chemical composition, Exhaust emission, Exhaust gases, Reaction kinetics, Soot, Thermochemical properties.

Based on an analysis of the interaction of fuel physical and chemical properties with combustion characteristics and indicators, a ranking of the importance of various fuel properties with respect to the combustion process was established. This ranking was used to define a suite of specific experiments whose objective is the development of an alternative fuels design data base. Combustion characteristics and indicators examined include droplet and spray formation, droplet vaporization and burning, ignition and flame stabilization, flame temperature, laminar flame speed, combustion completion, soot emissions, NOx and SOx emissions, and the fuels' thermal and oxidative stability and fouling and corrosion characteristics. Key fuel property data is found to include composition, thermochemical data, chemical kinetic rate information, and certain physical properties.

N83-23372/6/GAA PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Economy of Precipitating Agent Application in Municipal Wastewater Treatment Facilities.
U. Neis, B. Geppert, H. H. Hahn, and D. Gleisberg. Mar 83, 23p NAS 1.15:77059, NASA-TM-77059
Contract NASW-3541
Transl. Into English from Gwf-Wasser/Abwasser (West Germany), V. 122, No. 6, 1981 p 242-250.

Keywords: *Economic analysis, *Waste treatment, *Waste water, Effluents, Liquid wastes, Waste treatment, Water reclamation, Translations.

Purification by precipitation in this study is not considered primarily as a means of phosphate removal but as a method for reduction of suspended solids BOD and COD. A dynamic calculation procedure is used to allow for exact determination of time dependent variation of costs. The results show that costs of wastewater treatment by precipitation may equal those of conventional primary clarification and secondary biological treatment, especially with low-cost iron-II-salts in simultaneous precipitation and in larger plants (20,000 PF). Cost advantages may be accrued in smaller plants by using the more expensive trivalent salts in pre-precipitation as compared to conventional low-load biological treatment. This is due mainly to better effluent quality and, consequently, lower wastewater fees (Wastewater Discharge Act). If the precipitant is dosed temporarily only during periods of highest pollution the savings can be about 5 to 10%.

N83-23776/8/GAA PC **A05**/MF **A01**
Technische Univ. Berlin (Germany, F.R.). Fachgebiet Brennstofftechnik.
Energy Saving Incineration of Waste.
Final Report, May 1981.
H. Meierzukoecker, and R. Voegtli. Nov 82, 76p BMFT-FB-T-82-194, ISSN-0340-7608
In German; English Summary.

Keywords: *Energy conservation, Hydrocarbon combustion, Hydrocarbons, Oxidation, *Waste treatment.

The mechanism and the dimension of the preoxidation of the pollutants in the heat exchanger were investigated. A temperature control system was developed and tested. It is found that the preoxidation in the heat exchanger depends on the peculiarity of the pollutants and is inhibited by inactive walls with increasing of the specific surface. Active materials like copper only promote the oxidation of all pollutants in the low temperature region. Savings of supplemental energy about 25% are possible using process controlled auxiliary firing and combustion enthalpy of pollutants as a substitute for the supplemental energy.

N83-27012/4/GAA PC **A03**/MF **A01**
Luleaa Univ. (Sweden). Div. of Metal Working.
Powder Forging of Compound Steels, Part 1.
B. Aren. 1982, 27p TULEA-1982-16-PT-1, ISSN-0347-0881

Keywords: *Forging, *Steel industry, Composite structures, Ductility, Hardness tests, Interfacial tension, Tensile stress, Tensile tests.

Compound bodies consisting of ductile and hardened material were studied in order to determine the effect of tensile stress perpendicular to the interfacial plane. Samples with sharp and diffuse interfaces were investigated. It is shown that compound structures with considerable interfacial strength can be produced by powder forging. High compound strength is favored by a sharp interface between regions of dissimilar material.

N84-21767/8/GAA PC **A12**/MF **A01**
Public Service Satellite Consortium, Washington, DC.
Pacific Basin Communications Study, Volume 1.
Final Report, Sep. 1980 - Oct. 1981.
E. L. Young, and J. N. Hurd. Oct 81, 262p NAS 1.26:173173, NASA-CR-173173
Contract NASW-3488
Sponsored in Part by National Telecommunications and Information Administration.

Keywords: *Pacific islands, Communication, *Telecommunications, User requirements, Cost estimates, Education, Financial management, Health, Politics, Resources management, Safety, Technology utilization.

The Pacific Basin Communications Study describes and assesses extent telecommunications systems in the Pacific Islands region. The study examines user needs in terms of the development of social services and commercial activities. Alternative technological solutions to communications problems are proposed and described. Recommendations include the augmentation and improvement of existing systems allowing for increased communications capacity. Regional cooperation will be required to accommodate the specific, unique requirements of individual nations. Questions of financing, implementation, management, costs and benefits of a regional telecommunications system are discussed.

N84-25162/8/GAA PC **A04**/MF **A01**
Motorola, Inc., Phoenix, AZ.
Qualification Testing of Solar Photovoltaic Powered Refrigerator Freezers for Medical Use in Remote Geographic Locations.
Final Report.
W. J. Kaszeta. Dec 82, 58p NAS 1.26:168181,
NASA-CR-168181
Contract DEN3-240

Keywords: *Coolers, *Photovoltaic power system, *Solar energy, Compressors, Equipment specifications, Ice, Performance tests, Remote regions, Storage batteries, Vaccines.

One of the primary obstacles to the application of vaccination in developing countries is the lack of refrigerated storage. Vaccines exposed to elevated temperatures suffer a permanent loss of potency. Photovoltaic (PV) powered refrigerator/freezer (R/F) units could surmount the problem of refrigeration in remote areas where no reliable commercial power supply is available. The performance measurements of two different models of PV powered R/F units for medical use are presented. Qualification testing consisted of four major procedures: no-load pull down, ice making, steady-state (maintenance), and holdover. Both R/F units met the major World Health Organization (WHO) requirements. However, the testing performed does not provide complete characterization of the two units; such information could be derived only from further extensive test procedures.

ORAU/IEA-81-1(M)/GAA PC **A11**/MF **A01**
Oak Ridge Associated Universities, Inc., TN.
Opportunities for Energy Conservation in the Developing Countries.
P. Koshel, E. L. Allen, E. Cecelski, R. Dougher, and
L. Ring. Mar 81, 230p
Contract AC05-76OR00033

Keywords: *Haiti, *Sri lanka, Commercial sector, Cost, Data compilation, Domestic supplies, *Energy conservation, Energy consumption, Energy demand, Energy policy, Financial data, Fuel substitution, Government policies, Industry, Power generation, Renewable energy sources, Reserves, Residential sector, Transportation sector, ERDA/320000, ERDA/292000, NTISDE.

Energy problems faced by developing countries are explored and opportunities for saving energy and for using fuels other than petroleum in the modern sector are assessed. Specific resources assessed include oil and gas, coal, hydropower, and traditional fuels. Trends in commercial energy consumption by the developing countries are assessed and the domestic fuel resources of these countries are examined. Patterns of commercial energy use in several LDCs including Sri Lanka, Haiti, India, Kenya, Egypt, the Phillippines, the Republic of Korea, and Brazil are examined. Sri Lanka and Haiti are the subjects for case studies reported in the appendixes. Opportunities for conservation in the modern sector, which include most industrial activities, transportation, and electric power generation as well as some agricultural activities and large residential and commercial buildings, are discussed. The concluding section explores policies which might be initiated by LDC governments to encourage energy conservation. (ERA citation 06:022167)

PB82-101072/GAA PC **A05**/MF **A01**
Dufresne-Henry, Inc., North Springfield, VT.
Inexpensive Biologic Method of Upgrading Lagoon Effluent, Phase I: Small Business Innovative Research Program,
Gordon R. Pyper. Feb 81, 81p NSF/ISP-81003
Grant NSF-ISP80-09414

Keywords: *Ponds, *Sewage treatment, Cost analysis, Mathematical models.

The use of fresh water mussels to treat and upgrade wastewater lagoon effluent by filtering suspended solids and lowering the biological oxygen demand (BOD) is evaluated. The mussels were introduced to domestic waste effluent to (1) test their tolerance to environmental loading factors such as suspended solids, BOD, and heavy metals; (2) define their ability to remove the solids and BOD; (3) develop prototype data; and (4) formulate a cost and efficiency model for a tertiary lagoon. Lampsilis radiata were cultured in secondary lagoon wastewater effluent using continuous flow fields. Suspended solids and BOD changes were evaluated for several organic and hydraulic loadings. Heavy metals, dissolved oxygen, pH, BOD, chemical oxygen demand (COD), stress, and space needs were determined.

PB82-101395/GAA PC **A05**/MF **A01**
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
Marine Fish Larvae Growth and Survival: Effects of Density-Dependent Factors: Spotted Seatrout ('Cynoscion nueblosus') and Lined Sole ('Achirus lineatus').
Final rept.,
Edward D. Houde, and Keith Taniguchi. Sep 81, 77p
EPA-600/3-81-052, , ERLN-X1
Grant EPA-R-804519

Keywords: *Aquaculture, *Fishes.

Standard culture methods were developed for larvae of two common marine fishes, the spotted seatrout Cynoscion nebulosus and the lined sole Achirus lineatus. Culture methods were described and the relationships of survival, growth and yield to temperatures, food concentrations and egg stocking densities were determined. Two different diets, a laboratory-cultured diet based on the rotifer, supplemented in some experiments with brine shrimp, and a net-collected zooplankton diet were compared. Survival rates at metamorphosis in excess of 50% could be routinely obtained for both seatrout and lined sole when food, stock and temperature levels were near optimum.

PB82-101635/GAA PC **A11**/MF **A01**
SCS Engineers, Inc., Reston, VA.
Evaluation of On-Site Wastewater Treatment and Disposal Options.
Final rept. Oct 77-Oct 78,
David H. Bauer, E. T. Conrad, and Donald G.
Sherman. Sep 81, 234p* EPA-600/2-81-178
Contract EPA-68-03-2627

Keywords: *Sewage disposal, *Sewage treatment, Aerobic processes, Anaerobic processes, Filtration, Chemical removal(Sewage treatment), Lagoons(Ponds), Coagulation, Reviews.

A literature review of published and unpublished data was conducted to identify all conceivable alternative on-site systems, including wastewater manipulation, treatment and disposal options. Wastewater manipulation options included flow reduction, wasteload reduction and waste segregation. Treatment options included disinfection, biological, and physical/chemical methods. Disposal options included air, soil and surface water methods, and practical combinations. Both tested and untested systems were identified, and combinations of the various components were developed. An equipment inventory was then performed to determine the availability of hardware for the systems and system components identified. Data on engineering, economic, and environmental acceptability characteristics were collected. These systems were evaluated on the basis of performance, operation and maintenance, environmental acceptability, and total annual cost for 15 specific site conditions. Site conditions were defined by soil percolation rate, soil depth, slope, available land area, direct discharge effluent requirements, and net evaporation.

PB82-103045/GAA PC **A06**/MF **A01**
Robert S. Kerr Environmental Research Lab., Ada, OK.
Manual of Ground-Water Quality Sampling Procedures,
Marion R. Scalf, James F. McNabb, William J.
Dunlap, Roger L. Cosby, and John S. Fryberger. Sep
81, 105p EPA-600/2-81-160
Prepared in cooperation with Engineering Enterprises, Inc., Norman, OK.

Keywords: *Sewage disposal, *Ground water, *Water pollution, Microorganisms, Sampling, Organic compounds, Hazardous materials, Manuals.

Recent environmental legislation has recognized the importance of ground water quality protection and the stresses that man's activities, especially waste disposal, place on this vital national resource. To provide a realistic assessment of current and potential pollution problems and a rational basis for ground water quality protection, it is necessary to collect representative samples from this remote and relatively inaccessible environment. This report presents some procedures currently utilized to sample ground water and subsurface earth materials for microbial and inorganic and organic chemical parameters.

PB82-107129/GAA PC **A03**/MF **A01**
National Buildings Organisation, New Delhi (India).
Compendium of New Construction Techniques and Materials.
1980, 41p

Keywords: *Construction, *Building materials, Foundations, Walls, Doors, Windows, Floors, Roofs, Precast concrete, Masonry, Structural design, Buildings.

A number of new construction techniques incorporated in NBO Experimental Housing Projects are now being adopted by various construction agencies in the country resulting in appreciable reduction in the cost of construction as well as savings in scarce materials like cement and steel. These include single brick thick load bearing walls for up to 5 storied residential buildings, under-reamed pile foundation, precast RCC roofing system, precast lintels, etc. In this compendium brief details of these new construction techniques and materials have been compiled to propagate their adoption in practice by construction agencies.

PB82-107301/GAA PC **A04**/MF **A01**
JRB Associates, Inc., McLean, VA.
Solid Waste Data: A Compilation of Statistics on Solid Waste Management Within the United States.
1981, 74p*
Contract EPA-68-01-6000

Keywords: *Waste disposal, Refuse disposal, *Rural areas, Materials recovery, Sewage sludge, Sludge disposal, Statistical data, Tables(Data), States(United States), Municipal wastes.

This report represents a comprehensive compilation of the most current available information on solid waste management within the United States. This information is presented in tabular form and organized by general categories for ease of reference.

PB82-107830/GAA PC **A02**/MF **A01**
National Marine Fisheries Service, Washington, DC.
Fisheries Development Div.
List of Fishery Cooperatives in the United States, 1980-81,
Mikolaj Wojnowski. Jun 81, 14p* NOAA-81080701
See also report dated 1976, PB-272 202.

Keywords: *Fisheries, *Cooperatives, Fishing grounds, Personnel, *Fishes, Shellfish, Merchant ships, Boats, Organizations, Directories, Puerto Rico, United States, Commercial fishing.

This list has 116 fishery cooperatives in 16 States, Guam, Puerto Rico, and the Virgin Islands. It is by State and includes in most instances the telephone number of each cooperative as well as the address and the name of one of the officers, the date when each cooperative was incorporated, the number of members and boats, the type of cooperative activities, and the major species of fish and shellfish it handles.

PB82-108341/GAA PC **A09**/MF **A01**
East Central Oklahoma State Univ., Ada. Animal Waste Technical Information Center.
Livestock and the Environment: A Bibliography with Abstracts. Volume VII.
Final rept. 1 Mar 79-30 Jun 80,
M. L. Rowe, Linda Merryman, and Darla Stettler. Sep
81, 186p* EPA-600/2-81-225
Grant EPA-R-805151
See also Volume 6, PB80-102080.

Keywords: *Livestock, *Agricultural wastes, *Industrial wastes, *Waste disposal, Anaerobic processes, Methane, Air pollution, Indexes(Documentation), *Waste recycling, *Biogas.

Management and research information on animal wastes has expanded in recent years. This material has appeared in such diverse sources as journal articles, conference papers, university publications, government publications, magazine articles, books or book chapters, and theses. This bibliography was compiled in order to speed the flow of information on findings in one segment of livestock industry to other segments that could benefit from this technology.

PB82-108457/GAA PC **A04**/MF **A01**
SumX Corp., Austin, TX.
Feasibility of Photocatalytic Oxidation for Wastewater Clean-Up and Reuse.
Rept. for 4 Mar 81-31 Mar 81,
Gary R. Peyton, and David W. DeBerry. 1981, 55p OWRT/RU-81/1, W81-05701, , OWRT-C-90152-R(9425)(1)
Contract DI-14-34-0001-9425

Keywords: *Waste treatment, Water pollution, Feasibility, Technology, Solar energy, Semiconductors, Reaction kinetics, Catalysis, Organic compounds, Inorganic compounds, Cost analysis, *Waste water reuse, *Toxic substances.

A feasibility study has been conducted on a new treatment technology for the destruction of pollutant compounds in wastewater. The process uses solar energy to drive an oxidation which is photocatalyzed at the surface of a semiconductor powder. The process is being investigated particularly for water clean-up prior to industrial resuse, because of its non-energy-intensive nature. Five compounds (chloroform, dimethylamine, methanol, phenol, and ammonia) were used as model substrates, and removal at several pH values, using three different semiconductors (TiO_2, ZnO, and Fe_2O_3) was investigated in the laboratory, using a xenon lamp to simulate solar radiation. While Fe_2O_3 was found to be ineffective, both ZnO and TiO_2 catalyzed the removal of all compounds. Ammonia was not very effectively destroyed, but all four organic compounds experienced 30-50% removal in six hours at intensities slightly above that of normal solar radiation. Favorable cases were confirmed using sunlight. Quantum efficiencies for both sets of experiments were 13-20% for TiO_2 and 4-7% using ZnO. Estimated treatment cost for a 1 mgd stream using laboratory conditions ranged from $0.18-$0.72 per thousand gallons, depending on the values of engineering parameters which were not investigated in this feasibility study.

PB82-108903/GAA PC **A05**/MF **A01**
Oxford Univ. (England). Dept. of Engineering Science.
Corporate Organizational Design and Its Effect on Innovation,
Kenneth Abel. 1981, 77p* OUEL-1356/81

Keywords: *Technology assessment, *Management planning, Corporations, Organizations, Industries, Systems management.

The report examines those factors which appear to influence the success or failure of technology innovation in today's large corporation and highly regulated environment. The following topics are discussed: Why new products fail; Ventures & venturing; The entrepreneur; The organizational structure of successful innovation corporations; Venture management and matrix concepts and their implementation.

PB82-108937/GAA PC **A02**/MF **A01**
National Buildings Organisation, New Delhi (India).
Low Cost Brick House.
Nov 80, 15p ROOF OVER YOUR HEAD-2

Keywords: *Houses, *Rural areas, Bricks, Clays, Construction, Instructional materials, Developing countries.

Use of burnt clay bricks is very commonly made for construction of pucca houses. Brick masonry walls of both load-bearing and non-load-bearing types are constructed. In many parts of India reinforced brick roof arch or vault roof is also made. Use of bricks is also made for paving the floors, construction of jallies and lintels over windows and doors. A view of a demonstration low cost rural house put up by the NBO Regional Rural Housing Wing, Bangalore. The plinth area of the house is 26 sq m having one room, kitchen, bathroom and veranda. The cost of the house is Rs. 4,580. Burnt bricks have been used in construction of walls and Mangalore tile roofing over jungle wood rafters has been adopted.

PB82-108945/GAA PC **A02**/MF **A01**
National Buildings Organisation, New Delhi (India).
Making Mud Houses More Durable.
Mar 80, 18p HOUSING FOR MILLIONS SER-1

Keywords: *Houses, *Rural areas, Mud, Fire resistant coatings, Bitumens, Roofs, Construction, Developing countries.

To provide technical advice and information to the common man for building houses at low cost a series of popular booklets 'Housing for Millions' is being brought out for wide circulation. The material is based on a series of articles on low cost housing. This booklet contains information on water proofing treatment for mud walls, and fire retardant and water repellent treatment of thatch.

PB82-109752/GAA PC **A21**/MF **A01**
National Inst. for Water Research, Pretoria (South Africa).
Symposium on Aquaculture in Wastewater Held at Pretoria, South Africa on November 24-26, 1980.
Research rept.
1980, 489p CSIR-S-236

Keywords: *Waste water reuse, *Waste water, *Aquaculture, *Fisheries, *Algae, Lagoons(Ponds), Harvesting, Bacteria, Fungi, Yeasts, Proteins, Production, Marketing, Nutrients, Substrates, Carp, Eggs, Shellfish, Fresh water, South Africa.

Partial contents;
Session on algae;
Session on bacteria, yeasts and fungi;
Session on aspects of marine aquaculture;
Session on fish;
Session on product utilization.

PB82-110370/GAA PC **A07**/MF **A01**
Council for Scientific and Industrial Research, Pretoria (South Africa). Technical Services Dept.
Mini-Seminar on Industrial Training Held at Pretoria, South Africa.
Jun 81, 139p ISBN-0-7988-2080-2, TSD BOOK-0004/81

Keywords: *Training, *Computers, Specialized training, Visual aids, Instructional materials, Abilities, *South Africa, Education, Computer managed instruction, Skills.

The report discusses computer-based education and training in South Africa. Two separate components are examined: (1) Computer-assisted instruction for which the computer actually delivers instructional material to the learner and (2) computer-managed instruction which entails managing the student through a whole course of instruction.

PB82-110396/GAA PC **A04**/MF **A01**
Council for Scientific and Industrial Research, Pretoria (South Africa). Technical Services Dept.
Mini-Seminar on Value Engineering Held at Pretoria, South Africa.
Apr 81, 63p ISBN-0-7988-2078-0, TSD BOOK-0002/81
Prepared in cooperation with Value Engineering and Management Society (South Africa).

Keywords: *Management training, *South Africa, Cost analysis, Objectives, Decision making, Organization theory, Group dynamics, Creativity, Problem solving, Management methods.

Value Analysis, Value Engineering, and Value Management are names given to a disciplined analytical thinking process aimed at achieving high levels of effectiveness in decision making. It provides the capacity to generate a large number of alternatives prior to decision making and so renders decision making highly effective. Since decision making is rooted in the definition and choice of options, the Value disciplines provide a method of proliferating options.

PB82-110750/GAA PC **A02**/MF **A01**
National Center for Health Services Research, Hyattsville, MD.
Impacts and Trends in Health Care Delivery Research for the Clinical Laboratory.
Staff paper,
Vincent F. Maturi. Nov 81, 7p NCHSR-81-215
See also PB-281 893. Presented at the Annual Symposium on Computer Applications in Medical Care (5th), Washington, DC., November 1-3, 1981.

Keywords: *Health, *Health care delivery, Automation, Innovations, *Computers, *Information systems, Federal government, Medical computer applications, Health services research.

This paper reviews some of the Federal Government support of health care research on computer applications in the clinical laboratory. The significant innovations and features of this program are reviewed in detail and an analysis is made to determine trends and impacts.

PB82-113614/GAA PC **A02**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Selection of Geometric Design Standards for Rural Roads in Developing Countries,
R. Robinson. c1981, 19p TRRL-SUPPLEMENTARY-670
Also pub. as ISSN-0305-1315.

Keywords: *Roads, *Rural areas, Design standards, Geometry, Safety, User needs.

This Report discusses the underlying principles upon which it is recommended that geometric design standards for rural roads in developing countries should be based. The basic elements of geometric design are listed and an indication is given of their purpose and the objectives normally sought when geometric standards are adopted. The development of geometric design standards from first principles is discussed, with particular reference to existing geometric design policies currently being applied in industrialized countries. Finally, the problem of devising appropriate standards for roads in developing countries is considered. It is concluded that the basic standards of safety and comfort that are appropriate for a particular country are a matter for the national authorities to decide. In setting geometric standards consideration should be given to the costs of vehicle operation as well as to road construction costs. (Copyright (c) Crown Copyright 1981.)

PB82-113887/GAA PC **A05**/MF **A01**
South Dakota State Univ., Brookings. Water Resources Inst.
Animal Waste Effects Upon Crop Production, Soil and Runoff Waters,
Maurice L. Horton, John L. Wiersma, Ronald R. Schnabel, Ronald E. Beyer, and Charles G. Carlson. Oct 81, 88p EPA-600/2-81-230
Grant EPA-R-803662

Keywords: *Manures, *Crops, *Waste disposal, *Animal wastes, Volume, Corn plants, Soil water, Field tests, Land application, High Plains Region(United States).

This investigation was initiated to study the effects of application of differing rates of manure to land on crops, soil, and runoff water. The study was conducted under field conditions in the sub-humid climate of the Northern Great Plains. Manure application rates included levels from 0 to 180 MT/ha/yr. Manure applied to field plots was incorporated using a chisel plow as soon after application as possible. The test crop grown on the manure treatment plots was corn. One-half of the field plots were instrumented to automatically collect samples of any runoff waters leaving the plots.

PB82-114752/GAA PC **A05**/MF **A01**
Battelle Columbus Labs., OH.
Assessment of Future Environmental Trends and Problems: Agricultural Use of Applied Genetics and Biotechnologies.
Final rept.,
George H. Kidd, Melanie E. Davis, and Parviz Esmailzadeh. Sep 81, 97p EPA-600/8-81-019
Contract EPA-68-02-3640

Keywords: *Technology assessment, *Plants(Botany), Trends, Assessments, Environments, Agricultural engineering, Deoxyribonucleic acids, Public health, *Environmental impacts, Analytical methods.

Battelle's Columbus Laboratories will identify and define future environmental concerns arising from applying genetic engineering technology to agricultural problems. Two genetic emgineering technologies, plant tissue culture and recombinant DNA, will be considered. Potential environmental problems resulting from the research process (e.g. release or escape of recombinant organisms into the environment, dispersion or reproduction of recombinant organisms or molecules) and from applications of genetically engineered organisms (e.g., large-scale cultivation of a nitrogen-fixing grain crop) will be assessed. Information pertaining to potential problems will be obtained from the published scientific literature and from telephone interviews of experts currently active in applied genetics research. A cross-impact analysis program/model will be used to identify and define some impacts and trends, e.g., such as political, economic, and social settings which facilitate the agricultural applications of recombinant DNA. In addition to identification and definition of environmental impacts, other outputs would include identification of organizations and individuals interested or involved in agricultural genetic engineering, descriptions of trends that may affect public health or environmental policy, and identification of major data gaps and inadequacies in analytical methods.

PB82-115031/GAA PC **A12**/MF **A01**
Veterans Administration, Washington, DC.
Rehabilitative Engineering Research and Development, Spring 1980.
1980, 268p VA/80-5014
See also AD-A070 587.

Keywords: *Prosthetics, *Health, Bioengineering, Artificial limbs, Joints(Anatomy), Wheel chairs, Measurement, Pressure, Control, Rehabilitation, *Research and development.

The report includes articles on design of wheelchair cushions, methods of measurement of normal pressure between amputation residual limb and socket, means of control of powered prostheses by high-level amputees, electrotactile stimulation relevant to sensory/motor rehabilitation, and technique for displaying joint movement deviations.

PB82-115981/GAA PC **A02**/MF **A01**
Popkin (Joel) and Co., Washington, DC.
Analysis of the Effect of Recessions on Small Business' Output.
Final rept.,
Joel Popkin. Jul 81, 16p
Grant SB-1A-00026-01-0

Keywords: *Employment, Interest, Profits, Taxes, Earnings, Income, Capitalized costs, *Small businesses.

The study will assess the impact that slow growth or recession has on output and employment of small business vis-a-vis that of the total economy. The project will analyze the gross product by components--employee compensation, profit-type income, net interest, capital consumption allowances and indirect business taxes--for the years 1955-78 for small and large businesses.

PB82-117052/GAA PC **A18**/MF **A01**
National Research Council, Washington, DC.
Drinking Water and Health: Volume 2.
Sep 80, 406p* ISBN-0-309-02931-7
Contract EPA-68-01-3169
See also Volume 3, PB82-117060. Library of Congress catalog card no. 77-89284.

Keywords: *Potable water, *Health, *Water treatment, Comparison, Effectiveness, Microorganisms, Safe Drinking Water Act of 1974, Public Law 93-523.

Chlorination is the most widely used method for disinfecting water supplies in the United States. It is convenient to use, effective against most waterborne pathogens, and continues disinfectant activity within the distribution system. Chlorination is the standard disinfectant against which others are compared. However, chlorination can result in the formation of trihalomethanes (THM's) and other halogenated hydrocarbons. The discovery that some of these products are carcinogenic for experimental animals has prompted a reexamination of alternate disinfectants and procedures. The comparative effectiveness of 12 disinfectants or processes for inactivating microorganisms (bacteria, viruses, protozoa) were evaluated. Chlorination, ozonization, and the use of chlorine dioxide come closest to meeting the criteria established for a drinking water disinfectant. The ultimate choice among methods will require weighing the disinfectant efficacy, detailed in this evaluation, against the toxicity of the products produced by the use of a particular method of disinfection. The major objective of the review of disinfectant chemistry is the identification of products that are likely to be formed by the use of specific disinfectants. The identification of known and theoretical products of disinfection, which is attempted herein, is intended to be a guide to those contaminants that might require removal or toxicological evaluation.

PB82-117060/GAA PC **A19**/MF **A01**
National Research Council, Washington, DC.
Drinking Water and Health: Volume 3.
Sep 80, 428p* ISBN-0-309-02932-5
Contract EPA-68-01-3169
See also Volume 2, PB82-117052. Library of Congress catalog card no. 77-89284.

Keywords: *Potable water, *Health, *Water treatment, Epidemiology, Risks, Estimation, Toxicity, Contaminants, Nutritions, Minerals, Health risks, Safe Drinking Water Act of 1974, Public Law 93-523.

Contents: Executive summary; Epidemiological studies; Problems of risk estimation; Toxicity of selected drinking water contaminants; and The contribution of drinking water to mineral nutrition in humans.

PB82-117540/GAA PC **A02**/MF **A01**
Interagency Regulatory Liaison Group, Washington, DC.
Recommended Guideline for Acute Dermal Toxicity Test.
Jan 81, 14p

Keywords: *Health, Standards, Guidelines, Tests, Procedures, Evaluation, Bioassay, Exposure, *Toxic substances.

A test for acute dermal toxicity should evaluate the potential for systemic and local toxic effects of chemicals expected to come in contact with the skin. The acute dermal test refers to one period of topical application of up to 24 hours (the exposure period) and an observation period of at least 14 days.

PB82-117557/GAA PC **A02**/MF **A01**
Interagency Regulatory Liaison Group, Washington, DC.
Recommended Guideline for Acute Eye Irritation Testing.
Jan 81, 14p

Keywords: *Health, Standards, Guidelines, Tests, Procedures, Evaluation, Bioassay, Liquids, Solids, Aerosols, Laboratory animals, *Toxic substances.

This guideline delineates test procedures to evaluate the toxicity of liquids, solids, aerosols, and liquids propelled under pressure, to ocular tissues of laboratory animals. The test should demonstrate the potential of a substance to produce injury to the human eye. For humane reasons, substances known to be corrosive may be assumed to be eye irritants and should not be tested in the eye. Furthermore, substances shown to be severe irritants in dermal toxicity tests may be assumed to be eye irritants and need not be tested in the eye.

PB82-117672/GAA PC **A03**/MF **A01**
George Washington Univ., Washington, DC.
Impact of Tax and Financial Regulatory Policies on Industrial Innovation.
Final rept.,
Joseph J. Cordes. 1980, 48p* NAE/NRC-OFS-1979
Contract NSF-C310-T0-361

Keywords: *Industrial plants, *Taxes, Corporations, Government policies, Regulations, Marketing, Income taxes, Tax reform.

The document is one of a series of monographs addressing the major factors effecting industrial innovation. The areas of concern addressed in this document include corporate tax policy and innovation, personal income taxation and innovation, and innovation and government regulation of capital markets. Several recommendations are offered that address the stimulation of innovation through tax reform.

PB82-118969/GAA PC **A03**/MF **A01**
Institut Superieur de Developpement Rural de Bukavu (Zaire).
Appropriate Technologies (Technologies Appropriees),
Georges Defour. 1981, 30p*
Text in French.

Keywords: *Rural areas, Developing countries, Technology, *Water supply, Heating, Food processing, Developing country application.

This practical French language manual describes briefly how to make many appropriate technology tools to improve rural life. Among the topics covered are: making a cart; distilled water; more efficient stoves; peanut hulling; rat traps; water filters; solar water heaters; rehydration of diarrhetic children; refrigerators; corn shellers; solar crop dryers; surveying equipment; soya grillers; solar cookers; wind powered electricity generation; and pedal powered rotary saws.

PB82-119603/GAA PC **A05**/MF **A01**
Economic Research Service, Washington, DC. Natural Resource Economics Div.
Development and Institutionalization of Agricultural Resource Planning Concepts and Procedures in Developing Countries.
Staff rept.,
James B. Johnson. Sep 81, 100p AGES-810909

Keywords: *Agricultureal economics, *Land use, Production, Farm crops, Acclimatization, Statistical data, *Dominican Republic, *Costa Rica, *Nicaragua, Syria, *Honduras, Tables(Data), Economic models, Constraints, Institutional framework.

This report documents the development and adaptation of agricultural resource planning concepts and procedures for use in developing countries. Major concepts were those applicable to land resource delineation, major land use delineation, and the disaggregation of agricultural production and cropping pattern statistics to land resource delineations. The procedures used in the five developing countries are discussed. A limited discussion is presented on the design and application of two information systems that manage information obtained by inventory and assessment. The goals, purposes, and products of institutionalization activities in each of the five countries are presented.

PB82-120312/GAA PC **A08**/MF **A01**
Little (Arthur D.), Inc., Cambridge, MA.
Survey of Service Behavior of Large Evaporative Desalting Plants,
J. D. Birkett, and E. H. Newton. Apr 81, 166p* W81-06051, , OWRT-C-90023-S(9422)(1)
Contract DI-14-34-0001-9422

Keywords: *Desalination, Surveys, Design criteria, Performance evaluation, Construction materials, Sea water, Procedures.

A worldwide survey was made of 68 multi-stage flash and 4 multi-effect desalination plants to obtain data on operating characteristics, efficiency, and materials behavior as a function of design, operating conditions, and age. Extensive data on tube failures, flash chamber corrosion, productivity, etc., are reported as well as energy consumption and design factors. Pretreatment methods, operating temperatures and reasons for forced outages are described. 11 figures and 80 pages of tables provide detailed raw data as well as summaries and correlations.

PB82-120783/GAA PC **A03**/MF **A01**
Baylor Coll. of Medicine, Houston, TX. Dept. of Virology and Epidemiology.
Hepatitis B Vaccine Study.
Annual rept. 1 Jul 79-29 Jun 80,

F. Blaine Hollinger, and Erwin Adam. Jul 80, 44p
DAB-VDP-06-137
Contract N01-AI-92609

Keywords: *Vaccines, *Health, Humans, Safety, Efficacy, Dosage, Medical research.

Formalin-inactivated vaccine preparations for type B viral hepatitis are currently being evaluated in humans for safety, antigenicity, and efficacy. Current trials with small numbers of subjects (9 to 13 persons per schedule) have shown little variation between dosages used (10-40 micrograms) and the percentage of subjects responding or the geometric mean titer achieved (Hilleman, personal communication). The vaccine schedule selected for those trials was 0, 1 month, and 6 months. It is noteworthy that none of the vaccinees developed anti-HBs by the first month, and only about 25% displayed antibody by six weeks. In these early studies, dosage, route of immunization, and frequency of booster inoculations have been empirically determined. Thus, there is a need to systematically delineate these parameters of immunization in humans. The purpose of this study is to provide information on short-term reactogenicity of a hepatitis B vaccine prepared by the NIAID and to determine the optimal dosage and immunization schedule in young adults. Although there are a number of 'at risk' populations that will benefit from a vaccine for type B hepatitis, it is envisaged that such a vaccine will also eventually be used in infants and children born to chronic carrier mothers. Interruption of maternal-fetal transmission would greatly limit the pool of potentially infective individuals and may make an impact on long term sequelae of chronic infection such as cirrhosis and hepatoma.

PB82-122185/GAA PC **A07**/MF **A01**
International Business Services, Inc., Washington, DC.
Investigating the Relationship between Land Use Planning, Transportation and Energy Consumption.
Final rept.,
B. Burgwald, W. Cole, and C. Wagner. Jan 81, 143p
DOT/P-10-81-90
Contract DTOS59-80-C-0060
See also Volume 1, PB80-208424.Portions of this document are not fully legible.

Keywords: *Transportation, *Land use, *Urban planning, Housing, Design, Urban areas, Comparison, District of Columbia, Urban transportation, California, Florida, Maryland, Canada, *Energy conservation, Energy consumption, Case studies, Baltimore(Maryland), Toronto(Canada), San Francisco(California), Miami(Florida).

The objective of the study was to increase the understanding of the relationship among land use, transportation accessibility and energy consumption in an urban context. The issues addressed include: (1) How transportation accessibility and land use planning interact for increased energy conservation; (2) The role the public sector plays with regard to incorporating and integrating transportation, land use and energy conservation; and (3) The institutional and/or technical barriers for better integration of energy, transportation and land use considerations. The study combines an extensive literature survey in the subject areas with field case studies in five urban areas: Washington, DC; Baltimore, MD; Toronto, Canada; San Francisco, CA.; Miami, FL.

PB82-126756/GAA PC **A03**/MF **A01**
National Marine Fisheries Service, Seattle, WA.
Marine Fisheries Review. Volume 43, Number 4, April 1981.
Apr 81, 40p NOAA-81092101
See also Volume 43, Number 2, PB81-240939.

Keywords: *Fishes, *Fisheries, *Seafood, *Food processing, Trout, Animal migrations, Mollusca, Georges Bank, Announcement bulletins, Salmo gairdneri, Placopecten magnellanicus.

In addition to its usual sections, this issue contains the following articles: Low temperature preservation of seafoods; A review; Effect of arterial incisions on the amount of bleeding and flesh quality of Rainbow Trout; and Movement of tagged sea scallops on Georges Bank.

PB82-126764/GAA
(Order as PB82-126756/GAA, PC **A03**/MF **A01**)
National Marine Fisheries Service, Gloucester, MA. Gloucester Lab.
Low Temperature Preservation of Seafoods: A Review,
Louis J. Ronsivalli, and Daniel W. Baker, II. Apr 81, 16p
Included in Marine Fisheries Review, v43 n4 p1-15 Apr 81.

Keywords: *Food storage, *Seafood, *Food processing, Shelf life, Refrigerating, Refrigerants, Equipment, Reprints.

Cooling seafoods is among the most effective methods for preserving their quality. The authors describe three different states to improve the shelf life of seafood, chilling, superchilling, and freezing. This paper describes the common refrigerants including ice, brine, ammonia, fluorocarbons, cryogenic gases and liquids, chilled seawater, and refrigerated seawater.

PB82-128414/GAA PC **E04**/MF **E04**
Plastics and Rubber Inst., London (England).
Symposium on Mouldmaking 79.
25 Jan 79, 70p

Keywords: *Industrial plants, Tool steels, Dies, Electroforming, Research, Manufacturing, *Plastics, Maintenance, Performance evaluation, Energy dissipation, Computer applications.

Contents:
- Production planning & control - is it possible with mould making;
- Tool steels to the plastics industry;
- Mould energy dissipation;
- Recent developments in electroforming of moulds and dies;
- Science research council coordinated program of research on the manufacture of dies and moulds - the results of the first three years;
- Mould maintenance;
- Practical experience on the introduction of computer aided design and manufacturing methods in toolrooms.

PB82-129263/GAA PC **A07**/MF **A01**
Research Triangle Inst., Research Triangle Park, NC.
Topical Investigation and Analysis of Promoting Family Planning Through Health Services,
Fredric D. Kennedy. 1970, 127p AID-PN-AAH-577
Contract AID/nesa-460

Keywords: *Family planning, *Health, *Birth control, Reproduction(Biology), Fertility, Models, Data, Developing country application.

This investigation is concerned with the potential that health services provide for the promotion of family planning. This area of interest has many implications; these include economies of shared facilities and personnel, behavioral aspects of combined programs, priority conflicts in joint operations, long-term effects of fertility arising from mortality reduction, etc. The results of this investigation--three models for analysis and a structure of hypotheses to be tested using these models--can best be summarized under two general headings: first, the long-term effects of health services upon fertility behavior through mortality reduction and, secondly, the health service system as a means of promoting family planning.

PB82-129669/GAA
(Order as PB82-129628/GAA, PC **A05**/MF **A01**)
Shanghai First Medical Coll. (China).
New Concept on the Natural Course of Hepatocellular Carcinoma,
Zhaoyou Tang. 1981, 4p
Included in Chinese Medical Jnl., v94 n9 p585-588 1981.

Keywords: *Health, Pathology, Reprints, Cancer.

Based upon mass screening of hepatocellular carcinoma (HCC) using alpha fetoprotein (AFP) as tumor marker and long term follow-up study, a new concept concerning the natural course of HCC has been developed. Adverse to the previous concept of relative short survival, HCC exists and develops for a relatively long period before symptoms occur. A group of pathologically proven HCC cases receiving nonresectional treatment revealed that the median survival of subclinical HCC was 14 months versus 3 months in clinical HCC. 10 more months should be added from the first appearance of low but gradually increasing AFP of subclinical HCC, so the natural course of HCC is about 24 months. This relatively long period provides much more opportunity for successful treatment of this grave malignancy if it is detected early.

PB82-130147/GAA PC **A06**/MF **A01**
Urban Wildlife Research Center, Inc., Columbia, MD.
Planning for Urban Fishing and Waterfront Recreation.
Final rept.,
D. L. Leedy, T. M. Franklin, and R. M. Maestro. Jul 81, 119p FWS/OBS-80/35
Contract DI-14-16-0009-79-1014
Sponsored in part by Sport Fishing Inst., Washington, DC., and Academy of Natural Sciences of Philadelphia, PA. See also PB-280 172.

Keywords: *Urban planning, Aquatic biology, *Fisheries, Ecology, Parks, Decision making, Financing, Lakes, Streams, Erosion control, Water pollution control, Flood control, Habitats.

This document is intended to help planners and developers enhance fishing and waterfront recreation in urban areas by preserving existing high-quality aquatic areas, restoring degraded areas, and creating new areas where appropriate. Background information about environmental, fish and wildlife values, the nature of aquatic ecosystems, urbanization effects on these systems, planning and management implications and the importance of aquatic resource considerations in urban-suburban planning are discussed. Also discussed is planning for urban fishing and related waterfront recreation. Zoning, liability, safety, and other considerations are treated also.

PB82-130444/GAA PC **A10**/MF **A01**
California Univ., San Francisco.
Operations and Performance of Health Maintenance Organizations: A Synthesis of Findings from Health Services Research.
Rept. for 30 Sep 79-5 Jan 83,
Harold S. Luft, and Joan B. Trauner. Oct 81, 212p
NCHSR-81-228
Contract PHS-233-79-3016
Prepared in cooperation with Applied Management Sciences, Inc.

Keywords: *Health, *Health planning, Performance evaluation, History, Organizational structure, Health services research, Health care delivery organizations, Group health plans.

This synthesis of the available information on Health Maintenance Organizations (HMOs) includes historical and definitional perspectives; organizational and environmental factors influencing performance; a summary of what is and is not known about various dimensions--the claims, the expectations, current research findings of HMO performance, and a bibliography. HMOs often have been perceived as an answer to current problems in the health care system by serving their enrollees and providing a stimulus for change within the health care system. This review and analysis of existing research information is designed to focus on the major policy concerns and operational problems faced by state and local government officials and those in the private health care sector responsible for policy development and implementation, program planning and regulation, service delivery, and the purchasing of health benefits.

PB82-130477/GAA PC **A09**/MF **A01**
North Texas State Univ., Denton.
Health Care Services Utilization among Older Adults: Executive Summary.
Final rept. 30 Sep 79-28 Feb 81,
Susan Brown Eve. Jun 81, 184p NCHSR-81-216
Grant PHS-HS-03824

Keywords: *Health, Physicians, Hospitals, Dentists, Socioeconomic factors, Prediction, Interviews, Income, Education, Health services, Health surveys, Health insurance, Health maintenance organizations.

The purpose of this research was to examine the use of physicians, hospitals, and dentists among the noninstitutionalized population 65 years of age and older in the United States to determine what social, economic, and health factors were most predictive of the use of those services. Data on the 11,687 older adults interviewed in the 1975 Health Interview Survey were analyzed using path analysis. In the total adult population use of physicians was positively related to measures of illness, although private insurance was also positively related to use among the population 85 years of age and older; hospital use was positively related to illness measures; and use of dentists was positively influenced by income and education. Older adults who belonged to Health Maintenance Organizations used more physicians' services than non-members but did not differ in their use of hospital services.

PB82-131129/GAA PC **A11**/MF **A01**
Purdue Univ., Lafayette, IN. Joint Highway Research Project.
Investigation of Recycling Bituminous Pavements: Volume I,
James L. McKinney. Aug 81, 239p JHRP-80-15, FHWA/IN/JHRP-80/15
Prepared in cooperation with Indiana State Highway Commission, Indianapolis.

Keywords: *Pavements, *Construction, *Roads, Materials specifications, Guidelines, Construction management, Design, Indiana, *Waste recycling, Hot recycling, Cold recycling.

This report presents a detailed study of the processes used in recycling bituminous pavements. A set of guidelines was developed to assist the pavement engineering in determining if an asphalt pavement is a suitable candidate for recycling. A set of construction guidelines was developed to assist the construction engineer implementing the recycling method identified by the recycling guidelines. A section of an Indiana highway was selected to demonstrate the use of the guidelines. Volume I contains the description of the research topic, plus the recycling guidelines and construction guidelines developed in the study. A sample application of the guidelines plus the research summary is also included.

PB82-131343/GAA PC **A04**/MF **A01**
Agency for International Development, Washington, DC.
Water Supply and Diarrhea: Guatemala Revisited.
Evaluation special study no. 2,
Daniel Dworkin, and Judith Dworkin. Aug 80, 52p AID-PN-AAJ-007
Prepared in cooperation with Arizona Univ., Tucson. Dept. of Hydrology and Water Resources.

Keywords: *Diseases, *Water pollution, *Guatemala, *Diarrhea, *Water supply, Gastrointestinal diseases, Rural areas, *Sanitation, Developing countries, Sewage disposal, Waste disposal, Developing country application, Environmental health.

Evidence indicates that improved water supplies in rural communities reduce the incidence of diarrhea. To demonstrate this phenomenon, two communities in Guatemala, Florida Aceituna and Guanagazapa, were selected for study due to their similar population, environment, and health characteristics. The former, which obtained water from shallow wells and rivers, served as a control to establish a norm for diarrheal incidence without project assistance. The latter was provided with a piped chlorinated supply system. Data from both communities were analyzed independently. Halfway through the project, a program to alter sanitary behavior and encourage latrine construction was instituted in Guanagazapa, allowing changes in diarrheal incidence to be ascribed either to water alone or to both water and the new program. The mean amount used per person over the project was 25 liters daily for each person in Florida Aceituna and 68.4 liters in Guanagazapa. Eighty percent washed their clothes and bathed at home in Guanagazapa compared to less than 1/3 who did laundry and 1/5 who bathed in the control village. Guanagazapa showed a significant improvement in sanitary awareness over the project period and 79 new latrines were installed.

PB82-131475/GAA PC **A05**/MF **A01**
Federation of American Societies for Experimental Biology, Bethesda, MD. Life Sciences Research Office.
Effects of Dietary Factors on Skeletal Integrity in Adults: Calcium, Phosphorus, Vitamin D, and Protein.
Technical rept.,
Herman I. Chinn. Sep 81, 82p* FDA/BF-82/8
Contract FDA-223-79-2275

Keywords: *Nutrition, *Health, Nutritional deficiency diseases, Adults, Musculoskeletal system, Calcium, Phosphorus, Proteins, Vitamin D group, Hypocalcemia, Osteoporosis, Hyperparathyroidism.

Bone undergoes continuous remodeling as new bone is deposited and existing bone is resorbed throughout life. During middle age and in later years, the resorptive processes generally predominate, causing a net loss and weakening of the bones. If sufficiently pronounced, such loss of mineral content leads to osteoporosis, a relatively common disability of the elderly, especially postmenopausal women. While many factors including racial, genetic, hormonal, and physical aspects may contribute to the etiology of osteoporosis, this report focuses on the role of certain of the nutritional factors believed important in maintaining normal bone homeostasis, namely, calcium, phosphorus, protein, and vitamin D. The interrelations of these dietary constituents among themselves and with the various calcitropic hormones are discussed. The calcium requirements of adults remain controversial and a vast literature on the subject reveals widely differing opinions. An attempt is made to evaluate critically relevant studies and to identify reasons associated with these discrepancies. Calcium intakes and bone status have been studied by a number of epidemiologic, metabolic balance, absorptiometric, radiologic, tomographic, and other techniques. The advantages, reliability, and utility of these methods are described briefly. There is evidence to support the prophylactic use of calcium supplementation among postmenopausal women, but its therapeutic utility remains controversial. Specific topics requiring additional research are identified.

PB82-132374/GAA PC **A05**/MF **A01**
Williams (Charles W.), Inc., Alexandria, VA.
Future Developments in the Food Industry: Probable Efforts at Vertical Integration by Food Retailers.
Jul 81, 78p* FTC/OPP-81/07
See also PB82-132382.
Also available in set of 3 reports PC E13, PB82-132358.

Keywords: *Food, *Industrial development, *Marketing, *Food processing, Agricultural economics, National government, Government policies, Social change, Economic impact, Federal Trade Commission.

The writer's basic proposition is that sociological bias and regulatory and social constraints placed on national, branded food processors will combine with several key trends to create vertical integration in the food industry in the 1980s. This vertical integration will be led by a combination of farmers and agricultural producers, possibly uniteing into a coalition, who will place increasing competitive pressure on national food processors. These processors will be required to find innovative marketing concepts or be pushed into an increasingly weaker position within the food industry. This report contains an introduction and an executive summary, a review of those factors which are expected to influence vertical integration, possible scenerios, and implications of interest to the FTC.

PB82-132440/GAA PC **A02**/MF **A01**
Municipal Environmental Research Lab., Cincinnati, OH.
Evaluating Costs and Benefits of Alternative Disinfectants.
Journal article,
Robert M. Clark. 1981, 7p EPA-600/J-81-480
Pub. in Jnl. of the American Water Works Association, v73 n2 p90-93 Feb 81.

Keywords: *Health, *Cost benefits, *Economic analysis, Public health, *Water treatment, Water quality, Reprints, Environmental Protection Agency.

Environmental Protection Agency regulation of the maximum contaminant level for total trihalomethanes, along with the discovery that TRMS are formed during the disinfection process, has led to increased scrutiny of disinfection practices. An analysis of the cost-benefit ratios of chlorination and other methods of disinfection concludes that the benefits associated with any type of disinfection far outweigh the costs.

PB82-133257/GAA PC **A06**/MF **A01**
Federation of American Societies for Experimental Biology, Bethesda, MD. Life Sciences Research Office.
Effects of Consumption of Choline and Lecithin on Neurological and Cardiovascular Systems.
Technical rept.,
John L. Wood, and Richard G. Allison. Aug 81, 115p* FDA/BF-82/7
Contract FDA-223-79-2275

Keywords: *Health, Physiological effects, Ingestion(Biology), Consumption, Nervous system, Cardiovascular system, Patients, Arteriosclerosis, Alzheimers disease, Cognition, Benefits, Dyskinesia, Friedreichs ataxia, Gilles de la touretts disease.

This report concerns possible adverse health effects and benefits that might result from consumption of large amounts of choline, lecithin, or phosphatidylcholine. Indications from preliminary investigations that administration of choline or lecithin, by stimulating acetylcholine synthesis in the brain, might alleviate some neurological disturbances, prevent hypercholesteremia and atherosclerosis, and restore memory and cognition have resulted in much research and public interest. Symptoms of tardive dyskinesia and Alzheimer's disease have been ameliorated in some patients and varied responses have been observed in treatment of Gilles de la Tourette's disease, Friedreich's ataxia, levodopa-induced dyskinesia, mania, Huntington's disease, and myasthenic syndrome. Further clinical trials, especially in conjunction with cholinergic drugs, are considered worthwhile but will require sufficient amounts of pure phosphatidylcholine. The public has access to large amounts of commercial lecithin. Because high intakes of lecithin or choline produce acute gastrointestinal distress, sweating, salivation, and anorexia, it is improbable that individuals will incur lasting health hazards from self-administration of either compound. Development of depression or supersensitivity of dopamine receptors and disturbance of the cholinergic-dopaminergic-serotoningeric balance is a concern with prolonged intakes of large amounts of lecithin.

PB82-135351/GAA PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Surface Dressing in Developing Countries: Research in Kenya,
L. S. Hitch. c1981, 43p TRRL-LR-1019
Also pub. as ISSN-0305-1293.

Keywords: *Roads, Bitumens, Aggregates, Binders(Materials), Trafficability, Materials specifications, Seasonal variations, *Kenya, Developing countries.

In many developing countries surface dressing is used as a running surface on new low-cost roads as well as a maintenance treatment for existing roads. These countries are usually characterized by combinations of road surface condition, traffic, climate, and materials, that are not found in Britain and that are not favorable for good surface dressing. In such cases the recommendations for road surface dressing given in Road Note 39 which is intended for use in Britain, are not applicable. Jackson (1963) has proposed a method of surface dressing design based partly upon ideas put forward by Hanson (1935). This method was used to design a total length of 27 km of experimental sections of surface dressing in Kenya during 1975-77. This report describes the construction, monitoring and performance of the sections during the first 3--4 years trafficking. It is concluded that Jackson's design method works satisfactorily in Kenya conditions over the range of chipping size used in these trials, namely 5 mm to 13 mm average least dimension. (Copyright (c) Crown Copyright 1981.)

PB82-135401/GAA PC **A03**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.
Static Penetrometer for Soft and Loose Soils (Penetrometro Estatico Para Suelos Blandos Y Sueltos),
Enrique Santoyo, and Alfredo Olivares. Mar 81, 36p 435
Text in Spanish.

Keywords: *Soils, Measuring instruments, Shear strength, Penetration, Cohesive soils.

The geometric and electronic characteristics of a conventional static penetrometer are presented. The load capacity of its sensitive cells is adequate for soft cohesive or loose granular soils. A common hydraulic drilling rig is proposed as a driving mechanism of this penetrometer in soft or loose soils. To facilitate interpretation of results obtained with this instrument, a resume of the most accepted methods to obtain shear strength parameters is included.

PB82-135419/GAA PC **A06**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.
Scientific Research and Basic Needs of the People: A Method of Assessing Research Projects (Investigacion Cientifica Y Necesidades Basicas de la Poblacion: Un Metodo de Evaluacion de Proyectos),
Felipe Lara, and Lourdes Aragon. Oct 81, 108p 442
Text in Spanish.

Keywords: *Project evaluation, *Research and development, *Technology assessment, Evaluation, User needs, Universities.

A method is proposed that permits assessing research projects according to their impact upon the satisfaction of basic needs of the marginal population. Two kinds of impacts are considered: direct effects, when the research problem has a straightforward relationship with basic needs, and indirect effects, when the research project helps to develop a specific scientific area that can introduce new solutions to basic needs. The method of evaluation presented here was developed with the participation of the academic community. To illustrate its usefulness, an example from the social sciences has been considered.

PB82-135468/GAA PC **A03**/MF **A01**
Bureau of Mines, Washington, DC.
Alumina Availability--Domestic: A Mineral Availability System Appraisal.
Information circular,
Gary R. Peterson, Robert L. Davidoff, Donald I. Bleiwas, and Richard J. Fantel. Oct 81, 30p
BUMINES-IC-8861
Errata sheet inserted.

Keywords: *Aluminum, *Mining, Availability, Supply(Economics), Resources, Aluminum industry.

In order to determine the potential availability of alumina to feed U.S. aluminum smelters, the Bureau of Mines evaluated 39 domestic mines and deposits of bauxite, alunite, and high-alumina clays and found that substantial increases in alumina prices would be necessary before nonbauxitic deposits could become competitive with bauxite. As part of the study, a price-tonnage relationship was developed indicating the quantity of alumina that could be produced from known deposits at various alumina prices and at a 15-pct discounted cash flow rate of return on the required capital investment. All capital and operating costs were calculated in August 1980 dollars.

PB82-136425/GAA PC **A02**/MF **A01**
Fish and Wildlife Service, Lamar, PA. Lamar Fish Cultural Development Center.
Use of Self-Feeders in Fish Culture,
Ivan B. McElwain. Sep 80, 13p LAMAR INFORMATION LEAFLET-81-01

Keywords: *Aquaculture, *Fisheries, Manpower, Savings, Dried foods.

The use of self-feeders is becoming popular at fish hatcheries throughout the country. They can be used with many different species of fish as well as with fish of different ages and sizes. Advantages result in better quality fish along with money and labor savings. Disadvantages are few and can be minimized at the hatchery.

PB82-136631/GAA PC **A02**/MF **A01**
Fish and Wildlife Service, Lamar, PA. Lamar Fish Cultural Development Center.
Decapsulation of Brine Shrimp ('Artemia salina') Cysts,
P. B. Haines, R. G. Howey, and G. L. Theis. Sep 80, 12p LAMAR INFORMATION LEAFLET-80-06

Keywords: *Aquaculture, Feeding stuffs, Larvae, Fishes, Cysts, Digestion(Biology).

The outer shell of brine shrimp (Artemia salina) cysts can be removed by chemical treatment, resulting in improved digestibility of the hatched product when fed to larval fish.

PB82-136649/GAA PC **A02**/MF **A01**
Fish and Wildlife Service, Lamar, PA. Lamar Fish Cultural Development Center.
Controlled Large-Scale Hatching of Brine Shrimp, 'Artemia salina',
J. W. Meade, P. B. Haines, R. G. Howey, and G. L. Theis. Sep 80, 14p LAMAR INFORMATION LEAFLET-80-03

Keywords: *Aquaculture, Feeding stuffs, Larvae, Temperature control, Growth.

Brine shrimp (Artemia salina) nauplii can be cultured in large quantities for feeding larval fish by incubating Artemia cysts in containers in a simple, easily-constructed incubation cabinet.

PB82-137308/GAA PC **A11**/MF **A01**
West Virginia Univ., Morgantown. Dept. of Electrical Engineering.
Develop Grounding Practices for Metal/Non-Metal Mines.
Open-file rept. 1 Nov 79-31 Dec 80,
Wils L. Cooley, and Herman W. Hill, Jr. 27 Nov 81, 236p* BUMINES-OFR-154-81
Contract J038025

Keywords: *Mining, *Safety, Industrial accidents, Power supplies, Hazards, Accident prevention, Circuit protection, Safety.

This report analyzes electrical accident data in the metal-nonmetal mining industry. Accidents are categorized to determine the root causes. Special attention is given to accidents associated with inadequate or defective grounding of mine power systems. Recommendations are made concerning proper grounding practice, especially for dredges and for quarries in hard rock or sand. The costs of instituting the recommended practices are estimated for model mine power systems which are based on field data obtained from 37 mines and several electrical contractors. The expected benefits of various suggested safety practices are also estimated.

PB82-139106/GAA PC **A06**/MF **A01**
National Inst. on Drug Abuse, Rockville, MD. Div. of Research.
Benzodiazepines: A Review of Research Results, 1980.
Research mono.,
Stephen I. Szara, and Jacqueline P. Lundford. Nov 81, 112p DHHS/PUB/ADM-81-1052, NIDR/DR-81-06
Also pub. as National Inst. on Drug Abuse Research mono. 33. Report of the RAUS (Research Analysis and Utilization System) Review Conference on Benzodiazepines held September 12, 1980, Rockville, Maryland.

Keywords: *Health, *Drugs, Pharmacology, Biochemistry, Hypnotics and sedatives, Clinical medicine, Drug addiction, Drug abuse.

Benzodiazepines, the so-called 'minor tranquilizer' drugs, are very widely prescribed and used. The discovery of specific binding sites in the brain (1977) has made research on benzodiazepine receptors and their relation with neurotransmitter mechanisms a most active area of psychopharmacology. In addition, public interest in abuse potential and dependence liability of benzodiazepines is high. This monograph is based on a RAUS (Research Analysis and Utilization System) Review Conference held September 12, 1980. RAUS each year selects certain subject areas for intensive review, collects findings of all relevant intramural and extramural research supported by the National Institute on Drug Abuse, has them evaluated by scientific peers, then holds evaluative meetings to discuss findings and develop specific recommendations for future research. Subjects covered in this monograph include: basic biochemistry and neuroanatomy underlying the question of abuse potential of benzodiazepines, including the existence and sites of receptors involved; studies on self-administration in animals and humans; carryover effectiveness, rebound insomnia, and performance effects; clinical use patterns; misuse, abuse, and dependence.

PB82-139601/GAA PC **E05**/MF **E05**
Cranfield Inst. of Tech. (England).
Designing and Management Techniques for Fire Prevention in High Bay Warehouses.
1981, 88p ISBN-0-905823-08-7

Keywords: *Fire safety, Building codes, Fire detection systems, Fire fighting, Regulations.

Contents:
  Types of high-bay warehouses;
  Fire protection and fire fighting facilities in high-bay warehouses;
  Insurers requirements for high-bay warehouses;
  Protection of ancilliary accommodation;
  Requirements for fire protection in high-bay warehouses;
  The managerial aspects of fire protection in high-bay warehouses;
  Relative performance of in-rack sprinkler systems;
  Building regulations.

PB82-140823/GAA PC **A17**/MF **A01**
Pennsylvania Univ., Philadelphia.
Three Essays on the Econometrics of Production, Productivity, and Capacity Utilization.
Final rept. 15 Jan 81-82,
Menahem Prywes. Jan 82, 377p* DLETA-DD-42-81-02-1
Sponsored in part by Social Science Research Council, Washington, DC.

Keywords: *Econometrics, *Productivity, Energy, Capital, Labor estimates, Substitutes, Economic models, Return on investment, Chemical industry, Pareto allocations.

Essay 1 estimates capital-labor-energy-materials nested CES production functions for each of the twenty, two-digit SIC, industries in U.S. manufacturing, computes the implied elasticities of substitution, and develops a production function based capacity utilization series. Capital and energy are complements while labor and energy or capital are substitutes. Essay 2 develops an econometric technique for finding the industry-wide production function from information about the variation in productivity across production units. The technique is based on a theorem by Houthakker which connects the Pareto Capacity distribution to the aggregate Cobb-Douglas production function. Essay 3 uses production functions to analyze the returns to R&D and the effect of new OSHA and EPA regulation on productivity in the chemical industry. It also simulates the effect of a 30% investment tax credit on productivity.

PB82-141128/GAA PC **A05**/MF **A01**
Jorgenson (Dale W.) Associates, Cambridge, MA.
Energy-Economy Analysis and Application to R and D Planning.
Final rept. Oct 80-Sep 81,
Edward A. Hudson, and Paul A. Dorosh. Oct 81, 98p* GRI-81/0004
Contract GRI-5080-310-0329

Keywords: *Energy, *Economic analysis, Economic conditions, Economic development, *Research and development, Input output analysis.

Projections of energy and economic conditions and analysis of energy-economy interactions are based on a simulation model of the structure and growth of the U.S. economy (the Hudson-Jorgenson model). A reference projection is first constructed; this provides a reasonable estimate of future energy and economic conditions as well as providing information on economic growth, inflation and other variables required in project appraisal and R & D planning. Next, detailed analyses of energy-economy interactions are performed; these examine the mechanisms through which energy changes affect economic structure and growth, and also provide a basis for quantitatively estimating the economic effects of specific energy changes. Further, the analysis of energy-economy interactions provides a framework that helps the planner identify and allow for the indirect economic benefits from energy R & D. Finally, this study develops a central projection and likely ranges of variation of economic conditions and these, with associated probabilities, are applied to the appraisal of R & D strategies.

PB82-141771/GAA PC **A02**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Analysis and Modeling of Corrosion of Steel in Prestressed Concrete.
Nov 81, 25p NBSIR-81-2390
Sponsored in part by Department of State, Washington, DC.

Keywords: *Concrete, *Corrosion, Stress corrosion, Corrosion mechanisms, Electrochemical corrosion, Mathematical models.

Development of conceptual and mathematical models describing the corrosion of steel in prestressed concrete is outlined. The application of the principles of stress corrosion and general corrosion to understanding the mechanisms involved in corrosion of steel in prestressed concrete is discussed. The first step in estimating the failure time of a prestressed concrete structural system because of corrosion of the reinforced steel is to estimate corrosion rates under various but realistic conditions. A simplified approach based on mathematical modeling of concrete properties for estimating corrosion rates is proposed. Before the proposed mathematical model can be applied to practical problems information is needed on the specific mechanisms of corrosion cell processes of steel in prestressed concrete. In addition, well designed corrosion tests need to be performed in which all the important factors affecting the corrosion rates are considered.

PB82-142266/GAA PC **A06**/MF **A01**
Wyoming Univ., Laramie.
Synthesis of Environmental Management Strategies: Volume I.
Final rept.,
Curt Anderson, and Ralph C. d'Arge. Apr 80, 102p NSF/RA-800616
Grant NSF-ENV76-21645
See also Volume 2, PB82-142274.
Also available in set of 3 reports PC E19, PB82-142258.

Keywords: *Environmental surveys, *Economic analysis, *Environmental management, Cost analysis, Consumption rate, Natural resources, Mathematical models.

Results are presented of a study undertaken to emphasize the relationship between the economic system and the environment. The environment is shown to provide three basic services: it is a source of raw material inputs; it is a receptor of waste flows; it provides amenity services such as clean air, beautiful vistas, and recreational opportunities. These three services and their interrelationships are examined through the aid of a materials balance, or materials flow, model. The optimal use of material resources, both renewable and nonrenewable, is analyzed and related to the pricing of these resources over time. Optimal waste accumulation and the proper use of the environment as a sink for wastes is discussed. Consideration is given to the optimal development and use of natural environments. It is concluded that consumers should be charged for the marginal damages that their waste flows impose on others. The consumer would pay the full price of the materials used, the costs of production, and the cost imposed on the environment by the waste flows generated. The consumer then would have less incentive to use scarce resources and employ goods that result in harmful waste flows.

PB82-142274/GAA PC **A11**/MF **A01**
Wyoming Univ., Laramie.
Synthesis of Environmental Management Strategies: Volume II.
Final rept.,
Kenneth J. Arrow, and Sheldon Chang. Apr 80, 229p NSF/RA-800617
Grant NSF-ENV76-21645
See also Volume 1, PB82-142266, and Volume 3, PB82-142282.
Also available in set of 3 reports PC E19, PB82-142258.

Keywords: *Natural resources, *Economic analysis, *Environmental surveys, Waste disposal, Conservation, Distribution theory, Energy use, *Environmental management.

Reports are presented on various types of conceptual models on pricing of natural resources. Optimal policies are considered and simple dynamic optimizing models in the areas of nonrenewable energy use, renewable energy use, and waste accumulation are examined. An explanation is provided of the mathematics of optimal control theory. Current literature concerning resource use models, preservation models, and waste accumulation is reviewed, and a taxonomy of those models is formed. Some theoretical tools are offered for use in formally examining the equity issues raised in the case of pricing as a means to conserve scarce resources. The criteria that can be used to judge the equity of such a price change and the special problem raised by differences in elasticity of demand of different customer groups are analyzed. Toward this end, the concept of a 'superfair' distribution is introduced and discussed. It is a distribution under which each participant obtains a share of the total which is equal to or greater than the pro-ration share of that individual.

PB82-142357/GAA PC **A06**/MF **A01**
Transportation Research Board, Washington, DC.
Transportation System Management - Parking, Enforcement, and Other Issues.
Transportation research record,
Said M. Easa, Adolf D. May, Paul P. Jovanis, J. W. Hall, and Michael D. Meyer. 1981, 103p TRB/TRR-816, ISBN-0-309-03257-1
Library of Congress catalog card no. 81-22277. Also pub. as ISSN-0361-1981.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418.

Keywords: *Urban planning, *Traffic engineering, *Transportation management, Parking facilities, Central city, Fuel consumption, Local government, Regulations, Law enforcement, Neighborhoods, Systems management, Public transportation, Staggered work times, Commuting patterns, Transportation planning, High occupancy vehicles, Reserved lanes.

Contents: Evaluation of traffic management strategies in central business districts; Flexible work hours and mode change--interpretation of empirical findings from San Francisco; Assessment of flextime potential to relieve highway facility congestion; Fuel saving potential of low-cost traffic engineering improvements; Assessment of neighborhood parking permit programs as traffic restraint measures; South African parking standards; Implementation of a regional parking policy--institutional and political considerations; Role of law enforcement in transportation planning; Enforcement of TSM projects; Enforcement of parking management strategies--a critical element in program-project implementation; Enforcement requirements for high-occupancy vehicle facilities; Transit lane enforcement in the central city; Enforcement as a consideration in TSM planning; and New Jersey Turnpike automatic traffic surveillance and control system performance observation.

PB82-142936/GAA PC **A04**/MF **A01**
Kaiser Foundation International, Oakland, CA.
Development and Validation of a Method to Determine the Cost/Benefit Effectiveness of Occupational Health Programs (Technical Supplement to the Final Report).
Aug 74, 74p
Contract PHS-NIOSH-099-73-0053

Keywords: *Cost benefits, *Health, Cost control, Models, Development, Proving, Health care costs, Health care utilization, Analytical methods.

A generic model for the analysis of costs and benefits of occupational health programs is developed, and data from Kaiser Steel Corporation's Fontana Works used to test the validity of the model. A cost accounting system is developed for the medical facility which permits categorizing all of the costs for the resources for the facility on an annual basis. The actual dollar and nondollar, or intangible, benefits and their effectiveness are difficult to determine because the model needs more precise data. An employee attitude survey, planned to help identify some of the intangible benefits is not implemented because labor negotiations are incomplete.

PB82-143850/GAA PC **A03**/MF **A01**
Agricultural Cooperative Service, Washington, DC.
Subsidiaries of Agricultural Cooperatives.
Cooperative research rept.,
Charles A. Kraenzle, and David Volkin. Feb 79, 39p FCRR-4

Keywords: Organization theory, Marketing, *Cooperatives, Industrial theory, Ownership.

Little is known about why or to what extent cooperatives use subsidiaries for carrying out various functions. Their increasing use, indeed, the increasing dependence of some regional cooperatives on subsidiaries, has implications for other cooperatives considering this organizational tool. The study was undertaken to answer some of the questions concerning the use of subsidiaries.

PB82-144304/GAA PC **A03**/MF **A01**
Real Estate Research Corp., Chicago, IL.
Urban Infill: Opportunities and Constraints.
Working paper,
Deborah Brett, Margery al Chalabi, and Stephen B. Friedman. Jul 79, 45p HUD-0000833
Contract HUD-H-2982

Keywords: *Land use, *Economic development, *Urban planning, Urban areas, Real property, Problem solving, Land.

This paper discusses the advantages of urban infill as public policy, documents the problems associated with infill sites, identifies the amount of development that might be accommodated, and suggests how public agencies can make infill parcels more attractive for private development. Urban infill development is the economic use of vacant land in urban areas where water, sewer, and other public services already exist. Infill use results in the reduction of urban sprawl, less duplication of public facilities, preservation of valuable agricultural land, reduced energy costs, and increased tax revenues for older cities and suburbs. The private sector, however, has not developed infill sites because of inadequate capacity and condition of public facilities, developer and consumer willingness to assume the costs of new facilities in outlying areas, and lack of coordination in facility planning and service provision. Land speculation, corporate holding of infill land in reserve, tax delinquency and fragmented ownership issues, and ineffective marketing, among others, also discourage use of infill land. Recent changes in real estate development favoring infill are property tax limitations, surburban growth controls, changing demographics, availability of financing and insurance, and energy considerations. Some potential adverse impacts of infill use are reduction of open lands and of future development options, inflated land and construction costs, and greater State and regional action than was previously acceptable. Research and policy issues are listed.

PB82-145921/GAA PC **A17**/MF **A01**
National Research Council, Washington, DC.
Marine Invertebrates.
1981, 393p* ISBN-0-309-03134-6
Contract N01-CM-5-3850
Library of Congress catalog card no. 81-4015.

Keywords: *Aquaculture, Manuals, Sea water, Salinity, Temperature control, Maintenance, Acclimatization, Animal diseases, Laboratory equipment, Collecting methods, Mollusca, Arthropoda, Crustacea, Echinodermata, Feeding stuffs, Anesthetics, Transportation, Marking.

This manual summarizes contemporary methods for maintaining and rearing marine invertebrates in laboratories without immediate access to the sea. The first part contains general information. The second part consists of chapters written by investigators who are skilled in handling specific animals or groups of animals. Detailed directions are given on the animals' care and handling, on food requirements, and on ways to meet some of the difficulties that may arise. At best, this manual can provide specific recommendations for but a small number of species from among those potentially available.

PB82-146242/GAA PC **A03**/MF **A01**
National Oceanic and Atmospheric Administration, Washington, DC. Office of Coastal Zone Management.

Reviving the Urban Waterfront,
Andy Leon Harney. 1981, 50p NOAA-81110503
Prepared in cooperation with Partners for Livable Places and National Endowment for the Arts.

Keywords: *Urban planning, *Coasts, Recreation, *Land use, Design, Government policies, Water based recreation.

The Office of Coastal Zone Management has begun working with states through its grants programs to encourage the redevelopment of underutilized waterfronts for recreation, open space and economic development. The projects range from developing comprehensive plans to detailed architectural and engineering studies of waterfront areas. The seven projects described briefly in this publication are demonstrations of the important changes that can be brought about through imaginative reuses of urban waterfronts.

PB82-147398/GAA PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Program Analysis Div.
Small Businesses Are More Active as Inventors Than as Innovators in the Innovation Process.
31 Dec 81, 23p* PAD-82-19

Keywords: *Small businesses, *Research and development, Research projects, Bibliographies, National government.

In this report, GAO analyzes a number of studies that examine sources of invention and innovation and presents conclusions drawn from these studies about the contributions of small businesses to the innovation process. GAO concludes that small businesses have been important contributors to the innovation process and that they have been more active in invention than in innovation (actually brining an invention to market). While GAO was not able to generalize from the existing evidence to specify the level of small businesses' future contributions, no evidence was found to suggest that they might be less important to invention and innovation in the future than they have been in the past.

PB82-148271/GAA PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Marine Industry Advisory Services.
Progress in Controlled Environment Aquaculture and Algae Husbandry,
Norman Doelling. 1 Jul 81, 32p MITSG-81-5, OPPORTUNITY BRIEF-24, NOAA-81102110
Index No. 81-605-Ylr.

Keywords: *Algae, *Aquaculture, Shellfish, Design, Salinity, Diets, Controlled atmospheres, Prototypes, Delaware, Sea Grant program.

This Brief summarizes two food-related topics being investigated at the University of Delaware: closed cycle aquaculture systems for growing oysters, and the potential for domesticating plants which grow in brackish water for commercial sources of fodder, grain or seed crops. In both areas results indicate that industrial involvement could be timely and profitable. While the goal of economically raising oysters to full, marketable maturity remains unmet, the system may have significant value in growing seed oysters to sizes of up to about 1 cm.

PB82-148362/GAA PC **A10**/MF **A01**
Committee on Scholarly Communication with the People's Republic of China, Washington, DC.
Animal Agriculture in China,
Jacob A. Hoefer, and Patricia Jones Tsuchitani.
1980, 210p CSCPRC-11, ISBN-0-309-03092-7
Library of Congress catalog card no. 80-83376.

Keywords: *Animal husbandry, *China, Domestic animals, Production, Swine, Poultry, Cattles, Livestock, Agricultural economics, Animal products, Sheep, Goats, Breeding, Horses, Income, Animal nutrition, Animal diseases.

Partial contents:
A brief introduction to China and its animal industry;
Some notes on the characterization and distribution of domestic animals in China;
Some economics of animal production;
Swine production;
Poultry production;
Cattle and buffalo production;
Sheep and goat production;
The use of horses in China;
Utilization of animal products;
Reproductive performance of domestic animals and the science of reproductive physiology;
Animal breeding and genetics;
Nutrition research;
Animal health.

PB82-151440/GAA PC **A02**/MF **A01**
Centre Technique des Industries Mecaniques, Senlis (France).
Monitoring of Machines: Preliminary Study on a Transmission Gear Case,
G. Garcin. Sep 80, 13p CETIM-15-J-041-PT-3
Trans. of mono. Surveillances des Machines, n.p., n.d.
See also French version, N81-24481/6.

Keywords: *Automobiles, Vibrational spectra, Spectrum signatures, Spectrum analysis, Signal processing, Gear boxes, Frequency analyzers.

The application of vibration analysis to the surveillance of the mechanical condition of machines is proposed. A signal processing method, given vibration measurement data, is suggested. This method was validated using a wear test setup for studying the behavior of an automobile transmission to failure. The test bench is described, including type and frequency of measurements as well as measurement methodology. Results demonstrate the feasibility of diagnosing wear on machine parts through the statistical analysis of associated vibration signatures.

PB82-151507/GAA PC **E03**/MF **E03**
National Water Council, London (England).
Flexible Joints for Gravity Sewers.
Occasional technical paper no. 3,
R. P. Hardy. c1979, 28p ISBN-0-904561-51-8
Errata sheet inserted.

Keywords: *Pipes, *Sewage disposal, Specifications, Durability, Synthetic elastomers, Joint sealers, Design, Elasticity, Standards, Great Britain.

This report provides information on the various forms of 'flexible' joints for sewer pipes sealed with a ring made from an elastomeric (rubber like) material. The joint assembly should be watertight and be able to withstand the aggressive attack of soils, sewage and trade effluents. It should also retain sufficient elasticity to accommodate the long term movements of pipelines.

PB82-151721/GAA PC **A05**/MF **A01**
Enviro-Management and Research, Inc., Washington, DC.
Soldering and Brazing Safety Guide: A Handbook on Safe Practice for those Involved in Soldering and Brazing.
1981, 89p
Contract PHS-HSM-99-73-33

Keywords: *Industrial plants, *Safety, Manuals, Handbooks, Respirators, Standards, Procedures, *Occupational safety and health, Training programs.

A manual was prepared to provide those involved in welding and brazing with effective safety procedures for use in performance of their jobs. It is believed that in becoming familiar with those safety practices the workers will be able to understand and so avoid the frequent hazards associated with welding and brazing. Hazards exist in four types of general soldering and brazing processes: (1) cleaning; (2) application of flux; (3) application of heat and filler metal; and (4) residue cleaning. Most hazards during those operations can be avoided by using care, proper ventilation, protective clothing and equipment. Specific process hazards for various methods of brazing and soldering are treated. Methods to check ventilation are presented as well as a check of personal protective equipment. Personal hygiene and good maintenance practices are stressed. In addition, several emergency first aid treatments are presented.

PB82-153347/GAA PC **A07**/MF **A01**
Enviro Control, Inc., Rockville, MD.
Industrial Hygiene Characterization of Urea Formaldehyde and Polyurethane Foam Insulation,
Andrew A. Alcarese, Jr., and Robert P. Reisdorf. Oct 80, 138p*
Contract PHS-210-78-0081

Keywords: *Safety, *Environmental surveys, Exposure, Toxicity, Inspection, Hazardous materials, Formaldehyde, Diisocyanates, Ammonia, Acetaldehyde, Phenol, Carbon monoxide, *Toxic substances, *Occupational safety and health, Furfuryl alcohols, CAS 9011-05-6, CAS 68400-67-9, CAS 50-00-0, CAS 98-00-0, CAS 7664-41-7, CAS 75-07-0, CAS 108-95-2, CAS 101-68-8, CAS 26471-62-5, CAS 630-08-0, CAS 75-69-4, Isocyanic acid/methylene diphenylene-ester, Isocyanic acid/(methylphenylene-ester), Methane/fluoro-trichloro, Styrene/methyl, CAs 98-83-9.

Industrial hygiene surveys were conducted at eight facilities manufacturing and applying urea formaldehyde (9011056) and polyurethane (68400679) thermal insulation foam. Concentrations of formaldehyde (50000) ranged from less than 0.08 to 5.4 parts per million (ppm) in manufacturing facilities. A concentration of 300ppm of ammonia (7664417) was measured in a breathing zone at one manufacturing facility. Measurements for furfuryl-alcohol (98000), acetaldehyde (75070), phenol (108952), nitrosamines, and respirable dust were below detectable concentrations. Noise levels ranged from 83 to 99 and 96 to 105 decibels on the A-weighted scale (dBA) in manufacturing and application facilities, respectively. Wet bulb globe temperatures (WBGT) were as high as 29 degrees C in manufacturing facilities. Concentrations of diphenylmethane-diisocyanate (101688) (MDI), toluene-dissocyanate (26471625) (TDI), and fluorotrichloromethane (75694) (FTM) polyurethane foam ranged from less than 0.002 to 0.0050ppm, 22 to 310 parts per billion, and 0.95 to 193ppm, respectively. For application activities, concentrations of MDI, FTM alpha-methyl-styrene (98839) and carbon-monoxide (630080) ranged from less than 0.0010 to 0.068, 1.6 to 180, 0.17 to 0.21, and 30 to 50 ppm respectively. The authors note that the OSHA standards for formaldehyde are an 8 hour time weighted average (TWA) limit of 3ppm, for ammonia an 8 hour TWA of 50ppm; for MDI and TDI a ceiling limit of 0.02ppm; for FTM 1,000ppm; for alpha-methyl-styrene 100ppm; and for carbon-monoxide 50 ppm. The OSHA noise standard is 90 dBA for an 8 hour period. A standard of WBGT of 26.7 degrees C for moderate work is recommended by the American Conference of Governmental Industrial Hygienist. The authors conclude that formaldehyde, ammonia, MDI and TDI concentrations, noise and WBGT levels exceeded the standards and they recommend immediate corrective actions.

PB82-153362/GAA PC **A07**/MF **A01**
MetaMotrics, Inc., Washington, DC.
Desalting Demonstration Plant Feasibility Study at Laguna Pueblo, New Mexico.
Technical rept.
31 Mar 81, 132p MMI-528-80, W82-02104, , OWRT-C-002550-D(0452)(1)
Contract DI-14-34-0001-0452

Keywords: *Desalination, *Water treatment, Feasibility, *Potable water, New Mexico, Substitutes, Cost analysis, Capitalized costs, Operating costs, Substitutes, Design, Performance evaluation, Socioeconomic factors, Laguna Pueblo(New Mexico).

Water of drinking quality is scarce on the Laguna Reservation, located 20 miles west of Albuquerque, New Mexico. The feasibility of developing a demonstration desalting plant to provide for the water requirements of 2,000 members of the Laguna Pueblo included a review of the existing water resources. Four desalting and three non-desalting alternatives were evaluated. The study included legal, political and socio-economic factors important to developing water supplies in the water scarce environment. Of the brackish water sources, the Rio Puerco was the lowest cost alternative. The fresh water alternative could provide water at $1.93 per 1,000 gallons of water as compared to $4.01 per 1,000 gallons for desalting. The development of the Rio Grande fresh water aquifer would require the purchase of water rights and the City of Albuquerque could oppose such action.

PB82-153396/GAA PC **A05**/MF **A01**
Permutit Co., Inc., Paramus, NJ.
Non-Acid Pretreatment and Management of Microorganisms in Seawater Desalination by Reverse Osmosis,
A. B. Mindler. 12 Nov 81, 99p* W82-02108, , OWRT-C-00093-D(0466)(1)

Contract DI-14-34-0001-0466

Keywords: *Desalination, *Water treatment, Sea water, Coagulation, Filtration, Performance evaluation, Tanning materials, Polyacrylates, Fouling organisms.

Non-acid pretreatment was studied in a seawater reverse osmosis pilot plant for one year with particular attention to biological aspects. Pretreatment of the tropical surface seawater by in-line coagulation/filtration reduced the Silt Density Index (SDI) consistently below 3.0 in the polishing filter effluent. Subsequent biological activity of periphytic organisms on piping surfaces after addition of organic antiscalants increased SDI by one unit or more. Slough-off of the organisms' polysaccharide sheaths resulted in fouling of the hollow fiber permeators. A 2000 hour run was made with 3 ppm polyacrylate antiscalant at ambient pH of 7.9 on one RO system in parallel with another system at pH 7.5, reduced by addition of 15 ppm sodium bisulfite. A 3000 hour run was made with Quebracho tannin as combined antiscalant/antifoulant under similar conditions. For the last 1500 hours tannin was employed in place of starvation chlorination for intake protection. Both polyacrylate and tannin antiscalants were found to serve as nutrient for bacterial growth and both impaired RO performance. Tannin uniquely decreased the attachment ability of periphytic bacteria. No hard scale was found during autopsy, but a small amount of amorphous calcium salt was detected in potted fiber ends of the permeators and in piggyback spiral wound elements. Analyses of foulants are reported.

PB82-153487/GAA PC **A06**/MF **A01**
South Carolina Energy Research Inst., Columbia.
Energy Recovery from Textile Dryer Operations.
Final rept. on Phase 1, Jun 80-Jun 81,
F. J. McCrosson, J. D. Jenkins, and P. W. Yngve.
Aug 81, 122p GRI-80/0078
Contracts GRI-5080-342-0356, DE-AC05-80CS40360

Keywords: *Drying, *Textile industry, Drying apparatus, Heat recovery, Textile finishing, Heat exchangers, Humidity control, *Waste heat utilization, Energy conservation, Dryers.

The technical and economic feasibility of implementing a two-step approach for improving use of natural gas in textile dryer operations is presented. The first step involves automatic control of the dryer dampers to minimize the flow of exhaust heat without diminishing dryer performance. The second step involves recovery and use of a portion of the remaining exhaust heat. These two steps have the potential for reducing natural gas consumption in the dryers by 45 to 65 percent. Exhaust flow rates are minimized by increasing dryer humidity to the maximum practical limit. This maximum humidity, which is about 0.1 lb water/lb dry air, is maintained by automated adjustments of the damper. Three commercially available devices for measuring the stack humidity and controlling the dampers are discussed and a program for further evaluation presented. Several approaches for recovering some of the residual exhaust energy after the dampers have been adjusted are evaluated. Based on these evaluations, three commercially available air-to-air heat exchangers are identified as being particularly suitable for using the sensible exhaust heat to pre-heat dryer make-up air. A program to further evaluate these air-to-air heat exchangers at operating textile mills is presented.

PB82-153693/GAA PC **A04**/MF **A01**
West Virginia Univ., Morgantown. Water Research Inst.
Microbial Purification of Recycled Wastewater,
William J. Shoupp, John M. Dingess, and Paul G. Moe. 1981, 73p WRI-WVU-81-01, INFORMATION-15, W82-02172, , OWRT-A-034-WVA(2)
Contract DI-14-34-0001-9052

Keywords: *Waste recycling, *Sewage disposal, *Sewage treatment, *Waste water, *Waste water reuse, Microorganism control(Sewage), Aerobic processes, Activated sludge process, Biodeterioration, Residential buildings, Biochemical oxygen demand, Efficiency, Septic tanks.

A recycling sanitary-waste disposal system was developed and tested in the laboratory by using a synthetic fecal-urinous waste material. The system was capable of supporting an aerobic microbial population with an organic loading equivalent to the waste of three adults by using an aeration rate of 12 liters of air per minute. Increasing the temperature of the digestion tank from 23C to 34C reduced the rates of sludge and ammonia-nitrogen accumulation but had little effect on BOD-reduction efficiency. Shock loads of feed up to seven times normal rate caused temporary perturbations, but the microbial population in the system showed remarkable stability and rapid recovery. The BOD-reduction efficiency was generally better than 85 percent.

PB82-153735/GAA PC **A05**/MF **A01**
MetaMetrics, Inc., Washington, DC.
Draft Environmental Assessment Desalting Demonstration Plant, Laguna, New Mexico.
Technical rept.
Mar 81, 78p MMI-538-80, W82-02171, , OWRT-C-00255-D(0452)(2)
Contract DI-14-34-0001-0452

Keywords: *Environmental impacts, *Desalination, *Environmental surveys, Assessments, Feasibility, Water pollution, Air pollution, Noise, Substitutes, Plant location, Industrial wastes, New Mexico, Solid waste disposal, Design, Land use, Laguna Pueblo(New Mexico).

The environmental consequences of the construction and operation of a desalting demonstration plant were assessed. A desalting demonstration plant using brackish well water could supply a Laguna community which had been proposed for the site and the nearby Canoncito Navajo Reservation with potable water. A well field located at the plant site would withdraw approximately 400,000 gallons per day to produce 300,000 gallons per day of potable water. Yields of individual wells were estimated to be 50 gpm and as many as six wells would be required. Transmission of water from the well field to the plant site would require 1,000 feet of pipeline. The major waste products which will result from the operation of the desalting plant are a high TDS brine and sludges. Evaporation ponds would dispose of the brine. A design was specified to present leakage from the ponds. Multi-cell, sludge drying beds were specified for disposal of sludge. The environmental effects and impacts of construction and start-up of the plant were assessed along with those of the proposed new community.

PB82-153818/GAA PC **A06**/MF **A01**
Utah Biomedical Test Lab., Salt Lake City.
Evaluation of the Analytical Performance and Correlation with Myocardial Infarction of Seventeen Methods for Determining Creatine Kinase Isoenzymes.
Final rept.
May 81, 111p* TR-1608-005A, FDA/BMD-82/22
Contract FDA-223-74-5253

Keywords: *Health, *Enzymes, Clinical chemistry, In vitro analysis, Performance evaluation, Claims, Detection, Precision, Blood serum, Blood analysis, Diagnosis, Protocols, Analytical methods.

Using a literature survey for background information, a protocol was developed for evaluating the product characteristics or performance claims of products used for the detection of CK isoenzymes this report discusses three basic evaluations of product performance: (1) Determination of the precision of repeated analysis of frozen serum pools at three different activity levels using three different reagents lots, (2) analysis of samples obtained from patients admitted to a coronary intensive care unit in order to correlate the test results with physician diagnosis of the occurrence of myocardial infarction, (3) examination of the correlation of the quantitative results obtained from each method with the 'reference method'.

PB82-154550/GAA PC **A13**/MF **A01**
Utah Biomedical Test Lab., Salt Lake City.
Evaluation of the Physiological Role of Bilirubin and the Methods Employed for Its Determination in Serum.
Technical rept.,
Lynn Astle. 3 Mar 76, 284p TR-163-002, FDA/BMD-82/24
Contract FDA-223-74-5253

Keywords: *Health, Physiology, Clinical chemistry, In vitro analysis, Blood chemical analysis, Diazo processes, Spectrophotometry, Oxidation, Literature surveys.

This report consists of a literature review which discusses the physiology of bilirubin and the determination of bilirubin in clinical samples, including errors due to calibration and test procedures. Three methods of bilirubin determination are examined: diazo, spectrophotometric, and oxidative procedures.

PB82-155458/GAA PC **A09**/MF **A01**
Ryckman, Edgerley, Tomlinson and Associates, Inc., St. Louis, MO.
Industrial Hygiene Inspection Procedures Guide.
1981, 186p
Contract PHS-99-72-97

Keywords: Hazards, Procedures, Guidelines, Evaluation, Sampling, Ionizing radiation, Preventive medicine, Explosions, Odors, Air quality, Instruments, *Occupational safety and health, *Toxic substances, Air sampling, Compliance, Analytical methods.

First of three volumes of a manual intended to provide industrial hygienists with essential technical information in order to determine compliance with regulations, evaluate control measures, investigate problems in individual plants as well as on an industry-wide basis, and provide data for consultation with all parties concerning health problems. The main topics covered include: evaluation of the work environment in regard to hazardous conditions, statistical methods of sampling, recognition, evaluation and survey ofthe conditions; sampling and analysis of hazardous conditions, such as gases, vapors, aerosols, dusts, fumes, mists, physical hazards, radiation and airflow measurement; medical and biological procedures; interferences, limitations, precautions, calibrations, sampler collection efficiency and stability determination; calibration instruments and techniques for flow and volume calibration; data tables of more than 550 hazardous materials.

PB82-155748/GAA PC **A02**/MF **A01**
Svejsecentralen, Glostrup (Denmark).
Study of the Welding Industry with the Aim of Identifying, Measuring and Eliminating Health Risks to Welders,
Richard M. Stern. c1979, 20p ISBN-87-87806-28-2, 79-07

Keywords: *Safety, *Industrial plants, Identifying, Measurement, Welders(Personnel), Risk, Health risks, *Occupational safety and health.

The report contains diagrams which indicate chematically some of the large number of interacting factors which must be investigated to provide the ultimate database needed for the identification of high risk situations and the assignment of priorities for risk reduction.

PB82-155805/GAA PC **A02**/MF **A01**
Svejsecentralen, Glostrup (Denmark).
Study of the Total Hygienic Aspect of MIG/WIG Welding,
R. M. Stern. c1978, 15p 78.17

Keywords: *Safety, *Industrial plants, *Health, Methodology, Sampling, Fumes, Physical properties, Chemical properties, Gases, Distribution, Carcinogens, Mutagens, Risk, Assessments, Surveys, *Occupational safety and health, Threshold limit values, Photochemical oxidants, Air sampling.

It is expected to be able to rank a series of MIG/WIG processes in terms of total actual risk to the worker, measured on the basis of expected TLV values. It can be expected that present hygienic sampling strategies will be shown to be inadequate, and that suggestions for improved standards will be forthcoming. Operational guidelines for hygienic improvement of the working situation are only useful if monitoring techniques actually reflect risks of exposure, and improvements: there is current evidence that certain types of monitoring are so unreliable that they cannot be used as guides to industry. The methodology of pretesting 'improved products' will be developed so that their actual value in improving hygienic conditions can be measured in advance, and their relative usefulness determined. There is a significant probability that aerosols which are the mixtures of material from several processes (such as welding fumes and cutting oils) will be shown to have an especially high biological activity. Guidelines for segregation of processes may lead to an immediate reduction of total exposure at risk in these cases. The methodology for pre-exposure micro-biological testing protocols of new process aerosols will also be developed in cooperation with a series of laboratories in England and Scandinavia. (Copyright (c) by The Danish Welding Institute, 1979.)

PB82-156654/GAA PC **A05**/MF **A01**
National Rural Center, Washington, DC.
Agenda for Small Farms Research, A Report on Phase II of the National Rural Center's Small Farms Project,
J. Patrick Madden, and Heather Tischbein Baker.
Jan 81, 81p NSF/PAG-81002
Grant NSF-OPA78-15342

Keywords: *Farming, *Marketing, *Taxes, Prices, Income, Energy, Technology innovation, Farm management, *Small businesses, Industrial structure.

Literature review papers dealing with small farms research are summarized and topics meriting further research are identified. Subjects examined include values; production efficiency and technology; marketing; energy; tax policies; price, income, and credit policies; off-farm income; and structure of agriculture.

PB82-157975/GAA PC **A03**/MF **A01**
FilmTec Corp., Minnetonka, MN.
Post-Treatment Process for Reverse Osmosis Membranes.
Final rept.,
J. E. Cadotte, R. S. King, R. J. Majerle, C. Hultman, and R. J. Petersen. Jan 81, 39p W82-02454, ,
OWRT-C-90090-S(9415)(1)
Contract DI-14-34-0001-9415

Keywords: *Desalination, Sea water, Synthesis(Chemistry), Performance evaluation, Tests, Laboratory equipment, Water treatment, Thin-film composite membranes, Spiral wound membranes.

Reverse osmosis membranes capable of producing potable water from seawater by single-pass desalination processes are difficult to make. Small defects in the thin film barrier layer are introduced during various stages of production of desalination devices. This report covers research on synthetic and natural organic colloidal preparations that seal membrane defects. Types of colloids synthesized and tested included: polyamine-aldehyde, melamine-aldehyde, and polyphenol-aldehyde condensation products; piperazine-epoxy abducts; sulfonated polysulfone; oxidized polyamines, and crosslinked polyacrylic acid. Tannic acid was also tested for comparison. Colloidal preparations with 0.1-0.2 micrometer particle sizes worked best, and were found to seal defects as large as 500 micrometer in thin film composite membranes. Spiral-wound membrane elements with as low as 93 percent salt rejection were improved to single-pass desalination quality by treatment with selected colloids. Sequential treatment with a cationic colloid, then an anionic colloid, produced some dramatically increased salt rejections in spiral elements initially showing only 68-85 percent salt rejection.

PB82-158460/GAA PC **A03**/MF **A01**
Purdue Univ., Lafayette, IN. School of Civil Engineering.
SPERIL I - Computer Based Structural Damage Assessment System,
M. Ishizuka, K. S. Fu, and J. T. P. Yao. Nov 81, 44p
CE-STR-81-36, NSF/CEE-81075
Grant NSF-PFR79-06296

Keywords: *Earthquakes, *Computers, Computer programs, Structural analysis, Probability theory, Decision making, SPERIL computer program, Fuzzy sets, Ground motion.

Implementation of the SPERIL program (version 1), a computer based damage assessment system of existing structures which are subjected to earthquake excitation, is outlined. To obtain the classification of damage states, SPERIL can be used to interpret observation data including the results of analyzing accelerometer records and on-site visual inspection. An explanation of short term memory is provided and the control and rule based inference flow of SPERIL is examined. An explanation is given of the whole program configuration which consists of three separate files. A source program is included in the appendix.

PB82-159922/GAA PC **A05**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.
Optimization of Structural Shapes,
Augusto J. Durelli. Apr 81, 99p 437
Trans. of mono. Optimacion de Formas Estructurales, Mexico City, Apr 81.

Keywords: *Construction, Optimization, Structural members, Stress concentration, Finite element analysis, Shape, Translations.

A new method has been developed that permits the direct design of shapes of two dimensional structures, loaded in their plane, within specified design constraints and exhibiting optimum distribution of stresses. The method uses photoelasticity and requires a large-field diffused-light polariscope. The optimization process involves the removal of material (with a hand file or router) from the low-stress portions of the hole boundary of the model till an isochromatic fringe coincides with the boundary both on the tensile and compressive segments. Applications are also shown to the design of dove tails and slots in turbine blades and rotors, and to the design of star-shaped solid propellant grains for rockets, both for the case of parallel side rays and enlarged tip of rays. Comments are included on the use of other methods, in particular the method using finite elements, to optimize structural forms.

PB82-159989/GAA PC **A04**/MF **A01**
Christian Michelsens Inst. for Videnskap og Aandsfrihet, Bergen (Norway).
Powder Technology and Dust Explosions in Relation to Fish Meals,
Rolf K. Eckhoff. 10 Jun 80, 59p CMI-803301-2
Paper to be given at the International Symposium on the Processing of Fish Meal and Oil, Athens, October 6, 1980.

Keywords: *Fish protein concentrates, Silos, Particle size, Mass flow, Hazards, Solids flow, Food processing.

The powder mechanical bulk properties of fish meals have been studied as a function of particle size, shape and surface stickiness. Critical hopper geometry for mass flow in a silo is used as practical criterion. The dust explosion hazard is illustrated by laboratory test results as well as by an actual industrial explosion.

PB82-160193/GAA PC **A03**/MF **A01**
Lesotho Agricultural Sector Analysis Project, Maseru.
Manpower versus Machinery: A Case Study of Conservation Works in Lesotho.
Research rept. no. 6,
Ron Wykstra, and Jerry Eckert. Apr 80, 31p LASA/RR-6, AID-PN-AAH-742
Prepared in cooperation with Colorado State Univ., Fort Collins. Dept. of Economics.

Keywords: *Cost benefits, Conservation, Civil engineering, *Productivity, Cost estimates, Capital, Fixed investment, Construction costs, *Employment, *Lesotho, Job creation, Developing country application.

This paper propounds the use of labor-intensive over capital-intensive methods in conservation and other public works as a way of providing domestic employment--an argument supported by extensive cost-benefit comparisons and analyses of both methods. Using the results of an earlier analysis as augmented by new data on labor productivity and increased fuel prices, this paper clearly demonstrates that a program of labor-intensive public works is a viable strategy for further developing Lesotho's infrastructure, as well as for contributing significantly to its employment objectives. An 8-page appendix detailing the underlying cost analysis, as well as extensive tables and equations, are provided in support of the authors' conclusions.

PB82-160458/GAA PC **A03**/MF **A01**
National Association of Counties Research, Inc., Washington, DC.
Guide for Multijurisdictional Fire Protection Planning, A Draft Copy.
Apr 81, 47p FEMA-16
Grant FA-79022

Keywords: *Fire safety, *Safety, *Urban planning, Communities, Fire protection, Fire fighting, Warning systems, Local government, Coordination, Services, Guidelines.

The purpose the guide is to demonstrate a process by which multiple political jurisdictions may examine current fire protection systems in which they share common interests and plan for their future. A second edition, which will incorporate field testing experience and recommendations for improvement, will follow this edition. This guide is intended for use by those who have community-wide interest in and responsibility for fire protection but have not had significant previous experience with or exposure to professional planning concepts.

PB82-160466/GAA PC **A05**/MF **A01**
Gage-Babcock and Associates, Inc., Elmhurst, IL.
Small Business Firm as Provider of Fire Department and Emergency Medical Services in American Communities.
Final rept.,
John A. Campbell. 25 Jan 82, 100p
Contract SBA-2656-0A-79

Keywords: *Fire safety, *Small businesses, Supplying, Cost effectiveness, Communities, Attitudes, Local government, Businesses.

A study to examine existing public and private providers of fire and medical emergency services on a contract basis and to compare their costs and effectiveness in providing a given level of service. Guidelines will be prepared to enable small business to participate more effectively in these activities.

PB82-160912/GAA PC **A05**/MF **A01**
Water Resources Council, Washington, DC.
Nonstructural Alternatives in Municipal/Industrial Water Management.
Jan 81, 98p
Prepared by IEP, Inc., Wayland, MA.

Keywords: *Water supply, *Urban planning, *Waste water reuse, Management, Industrial water, Water consumption, Water conservation, Benefit cost analysis, Prices, Government policies, Regulations, Water costs.

The following section discusses the various forms of legal-institutional arrangements and other operational components of the system which exist among the water supply departments, companies, and districts.

PB82-162389/GAA PC **A03**/MF **A01**
National Research Council, Washington, DC.
Improving Managerial Evaluations of Computer-Aided Manufacturing.
Final rept.
Dec 81, 50p*
Sponsored in part by Air Force Systems Command, Washington, DC. Prepared in cooperation with Case Western Reserve Univ., OH.

Keywords: *Management techniques, *Computers, Budgeting, Fixed investment, System analysis, Data processing systems.

The dominant obstacle to more effective evaluation of computer-aided manufacturing (CAM) is the continuing failure of most industrial managements to realize that CAM offers potentials far beyond merely reducing requirements for machine operators. In addition, American managements tend to emphasize short-term returns, technical specialists are losing some of their influence over company policy, and CAM expertise among senior officials is rare. This report discusses these problems and presents a model for managerial evaluations of CAM systems that should be more effective in capturing their distinctive capabilities and requirements than prevailing capital budgeting approaches for appraising proposed acquisitions of new equipment and facilities. It is hoped that the availability of such a model will help to accelerate the diffusion of CAM systems in domestic industries and thus improve their productive efficiency.

PB82-163031/GAA PC **A03**/MF **A01**
New Hampshire Univ., Durham. Coherent Area Sea Grant Program.

Husbandry of Mussels in a Maine Estuary: An Approach to a Commercial Enterprise,
Edward A. Meyers. c1981, 44p UNH-SG-164, NOAA-81121409
Grant NOAA-04-3-158-38
Prepared in cooperation with Abandoned Farm, Inc., Damariscotta, ME.

Keywords: *Aquaculture, *Economic analysis, Growth, Seeds, Prices, Proteins, Maine, Sea Grant program.

This document sets out to assess the possibilities for making the husbanded mussel a money crop on the Maine coast. The objective of Abandoned Farm's subcontract with the University of New Hampshire, which spanned 39 months, until March 30, 1978, was, if possible, to create a commercially effective company engaged in the husbandry of mussels. The idea was to sell mussels for more than it cost to tend and harvest them.

PB82-164542/GAA PC **A04**/MF **A01**
National Cancer Inst., Bethesda, MD. Carcinogenesis Testing Program.
Bioassay of Selsun (Trade Name) for Possible Carcinogenicity.
Technical rept.
1980, 64p* NCI-CG-TR-199, NIH/PUB-80-1755, NTP-80-19

Keywords: *Health, Bioassay, Malignant neoplasms, Mice, Skin(Anatomy), Exposure, Inorganic sulfides, Cancer, Shampoo, Selsun.

The bioassay of Selsun for possible carcinogenicity was conducted by applying this substance dermally to ICR Swiss mice. Selsun, an antidandruff shampoo, contains 2.5% selenium sulfide. Groups of 50 mice of each sex were exposed to 0.05 ml of 25% or 50% Selsun in distilled water three times a week on a 2- x 3-cm clipped dorsal surface. Vehicle controls consisted of 50 mice of each sex that were clipped and treated with distilled water. Untreated controls consisted of 50 mice of each sex that were only clipped. Surviving mice were killed and necropsied at week 88. Mean body weights of untreated control, vehicle control, low-dose, and high-dose groups were comparable throughout the bioassay. Amyloidosis was a factor in the deaths of most animals after 1 year. In male mice, alveolar/bronchiolar carcinomas or adenomas occurred with a dose-related trend that was significant (P=0.008). The result of the Fisher exact test comparing the incidence in the high-dose group with that in the vehicle controls is also significant, but the incidence of the high-dose group, when compared with that of the untreated controls, is not significant. Under conditions of this bioassay, dermal application of Selsun was not carcinogenic for ICR Swiss mice. The study was limited, however, by the relatively short lifespan of this strain of mouse.

PB82-165283/GAA PC **A04**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Communication Systems for Disabled Users of Buildings,
Belinda L. Collins, William F. Danner, and Robert L. Tibbott. Dec 81, 74p* NBSIR-81-2428
Sponsored in part by Architectural and Transportation Barriers Compliance Board, Washington, DC.

Keywords: *Communication, *Telecommunications, Building codes, Handicapped persons, Buildings, Warning systems, Safety engineering, Availability, Requirements.

Communication systems in buildings are designed to provide both emergency and directional information to all building users. Yet such systems, which are typically comprised of visual signs and audible alarms, may fail to reach some of the estimated twenty-seven million hearing or vision impaired people in the United States. As a result, a number of alternative communication systems have been proposed for inclusion in accessibility guidelines. In the following pages the research base underlying communication provisions for each of three sensory modalities, vision, hearing and touch, are reviewed. In addition, various proposed code recommendations are presented and discussed. The adequacy of the research base for each provision is discussed along with the need for various code provisions. It is noted that code provisions for tactile warnings and exit markings are particularly inadequate. Recommendations for further research into tactile warnings, tactile signage, and visual alarms are suggested.

PB82-165473/GAA PC **A09**/MF **A01**
Battelle Columbus Div., OH.
Effects of Inflation on Small Business.
Final rept.,
Mark Berger, Belton Fleisher, Edward Honton, and Donald Parsons. 1 Feb 82, 187p
Sponsored in part by Small Business Administration, Washington, DC. Office of Economic Research. Prepared in cooperation with Economics Research Group, Inc.

Keywords: *Economic analysis, Economic impact, Competition, Production management, Production planning, Production capacity, Labor estimates, Prices, *Small businesses, Economic elasticity, Industrial structures.

This research will examine the impact that rising energy prices, interest rates and unskilled labor costs have had on firms of varying size and how, as a result, the level of competition has been affected in different industries. The research will discuss the ability of firms of varying size to adjust production processes to minimize the burden of these increases.

PB82-166075/GAA PC **A08**/MF **A01**
California Univ., Berkeley. Earthquake Engineering Research Center.
Evaluation of Seismic Design Provisions for Masonry in the United States,
Bjorn Ingi Sveinsson, Ronald L. Mayes, and Hugh D. McNiven. Aug 81, 173p* NSF/CEE-81041
Grant NSF-PFR79-08251
Prepared in cooperation with Masonry Institute of America, Western States Clay Products Association, and Concrete Masonry Association of California and Nevada.

Keywords: *Earthquakes, *Buildings, *Earthquake engineering, Dynamic structural analysis, Mechanical hysteresis, Dynamic response, Building codes, Earthquake resistant structures, Stress analysis.

This report presents an evaluation of two sets of seismic design provisions for masonry construction in the United States - namely, the 1979 Uniform Building Code and the ATC-3-06 'Tentative Provisions for the Development of Seismic Design Regulations for Building'. The method of evaluation is based on an overdesign ratio which compares the shear wall area required to resist code loads with that required to resist realistic earthquake loads. The latter area is determined from test results from the continuing masonry research program at the Earthquake Engineering Research Center, University of California, Berkeley. A summary of the test results is included in this report. The report also contains a comparison of the shear wall areas required by the two sets of seismic provisions, and changes to both sets of provisions are suggested.

PB82-166182/GAA PC **A05**/MF **A01**
California Univ., Berkeley. Earthquake Engineering Research Center.
Experimental Study of Lead and Elastomeric Dampers for Base Isolation Systems,
James M. Kelly, and Stuart B. Hodder. Oct 81, 88p UCB/EERC-81/16

Keywords: *Buildings, Bearings, Elastomers, Chloroprene resins, Mechanical hysteresis, Shear properties, *Earthquake engineering.

This report describes a series of experiments carried out on the shaking table at the Earthquake Simulator Laboratory of the Earthquake Engineering Research Laboratory, involving a base isolation system which incorporated multilayer isolation bearings of polychloroprene rubber. Several forms of isolation system using the same basic bearing design but including inserts of different materials in a central hole in each bearing were studied. The inserts were used to enhance the damping properties of the system and to improve the response. The results indicate that there are no difficulties in designing an effective isolation system in polychloroprene rubber and that the multilayer elastomeric bearings can substantially reduce the seismic loads experienced by a building and its contents. Elastomeric inserts were effective in improving the response only to a limited extent. The use of lead inserts to enhance the damping was very effective in controlling the displacement. There is an increasing interest in the use of base isolation as a way of reducing the effects of earthquakes on structures. There is general acceptance of the concept but doubts about its implementation center on the question of suitable bearings. Experiments of the kind reported here, on large models where scaling effects are minimized, can allay the fears of the seismic engineering profession that bearings may not be available.

PB82-168659/GAA PC**$12.50**
Okochi Memorial Foundation, Tokyo (Japan).
Research and Development in Japan Awarded The Okochi Memorial Prize.
c1981, 107p*

Keywords: *Research and development, *Productivity, Seamless pipes, Roll piercing, Integrated circuits, Coating processes, Oxidation, Antibiotics, Sulfation, Sulfonation, Metal rolling, Steel making, Automation, Computers, Semiconductor devices, Electron beam welding, Coke, Dibekacin, Photoresists.

Contents: Development of a new seamless pipe manufacturing process based on industrialization of the press roll piercing method; Development and mass production of a family LSI's for microcomputers; Development of deep ultraviolet mirror projection system; Development and industrial application of carbide coating process by use of molten borax bath - TD Process; Development and commercial use of high pressure silicon oxidation method; Development of dibekacin and its industrial production; Development of continuous sulfation and sulfonation technology by climbing film reactor; Development of a new continuous bar rolling system by direct measurement of tension (SNTC); Development of steel mass production technology with bottom-blown converter; Automation of assembly, inspection and packing of small-sized electronic calculators; Development of high-performance photoresists for semiconductor devices processing and establishment of technology for its production; Establishing a mass production system for the powder coating of automotive vehicle bodies; Practical application of high power electron beam welding; and Technology for needle coke production from coal tar pitch.

PB82-169871/GAA PC **E04**/MF **E04**
Oxford Univ. (England). Commonwealth Forestry Inst.
Tropical Rainforest Silviculture: A Research Project Report,
T. J. Synnott. 1981, 52p CFI/OP-10
Also pub. as ISSN-0141-8181.

Keywords: *Forestry, *Tropical regions, Forest trees, Lumbering, Plant growth, Cutting, Yield, Computer programming, Production, Mortality, Mathematical models, Silviculture.

This report describes the results of a research project concerned with silviculture and management of tropical rainforest. Data from silvicultural treatment experiments were analyzed to examine the effects of logging and treatments on growth rates and yields. It was shown that diameter increments, and basal area and volume production, were strongly affected by reductions in stocking resulting from logging and treatment. Various computer programs were developed and adapted for processing data from recurrent measurements of rainforest plots.

PB82-170093/GAA PC **A02**/MF **A01**
Department of Housing and Urban Development, Washington, DC. Div. of Policy Studies.
Housing Cost Reduction Demonstration.
Dec 80, 14p HUD-606-H, HUD-0002295

Keywords: *Houses, Housing, Housing planning, *Technical assistance, Building codes, Construction costs, Land use zoning, California, Louisiana, Pennsylvania, Oregon, Hayward(California), Shreveport(Louisiana), Allegheny County(Pennsylvania), Clark County(Oregon).

This report presents the results of a demonstration project designed to test how to reduce the cost of single-family housing units using local government regulations as the only variable. The demonstration was concerned only with the effect of zoning ordinances, subdivision regulations, and building codes on the cost of housing. The concept behind the demonstration was to ask the builder/developer to be creative and to design the site and the buildings to meet contemporary architectural, engineering, and site planning standards. The local governments were asked to permit minor deviations from existing regulations to permit the builders' innovations. They were also requested to provide expedited processing and to determine how rapidly reviews could be completed to enable construction to start as rapidly as possible. A limited demonstration in the following four locations was conducted: Hayward, CA.; Shreveport, LA.; Allegheny County, PA.; and Clark County, WA. Cost savings are noted for all sites. In Shreveport, the demonstration consisted of townhouses located on three inner-city sites. The builder estimates that about $15,000 was saved per unit, representing a 21-percent reduction in cost from the comparable $70,000 unit that would be built with conventional processing times. The demonstration in Hayward included 58 townhouse units at a single location. The developer estimates cost savings ranging from $26,500 to $32,500 on the various kinds of housing units. Cost savings are also noted for Allegheny County and Clark County. Tabular data and drawings are included.

PB82-170234/GAA PC **A07**/MF **A01**
Vsesoyuznyi Nauchno-Issledovatel'skii Inst. Gidrotekhniki i Melioratsii, Moscow (USSR).
Survey of Joint US-USSR Experience in Effective Use of Saline Irrigated Lands,
L. G. Balaev. 1981, 150p
Sponsored in part by Bureau of Reclamation, Denver, CO.

Keywords: *Land use, *Irrigation, *Leaching, Drainage, Permeability, Neutralizing, Inorganic acids, Mathematical models, Salinity, Ground water, Water quality.

This book includes works of Soviet and American scientists on the problem of 'Effective Use of Saline Irrigated Lands'. Wide-scale development of irrigation on saline lands or those prone to salinization under conditions of rational use of limited water resources, calls for effective methods of land reclamation including leaching, maintenance of leaching irrigation regimes on lands with drainage systems, and use of drainage water for irrigation. On the basis of generalized material, recommendations on the leaching technology on irrigated lands are given in the study.

PB82-170242/GAA PC **A06**/MF **A01**
National Research Council, Washington, DC.
Reindustrialization or New Industrialization, Minutes of a Symposium.
Final rept.
13 Jan 81, 109p*
See also PB82-170259 thru PB82-170325.

Keywords: *Economic development, Technology innovation, Iron and steel industry, Manufacturers, Computers, Semiconductor devices, Textile industry, Productivity, Government policies, *Industrial development, Steel industry.

Reindustrialization has achieved a great deal of currency recently to describe the efforts by U.S. industry to improve growth, raise productivity, and work better and smarter. The issue raises difficult questions. How, for example, does one balance the impacts of continued support for traditional industries against the potential risks and benefits of stimulating new industries. What criteria can be used to distinguish viable industries from moribund ones. How useful in this country are foreign models of industry-government cooperation. What is the role of industrial innovation, and how can it be fostered. The Manufacturing Studies Board organized a symposium on January 13, 1981, at which invited speakers with a variety of interests and views presented their thoughts on industrial trends, the federal role in strengthening U.S. industry, and the issues that need to be clarified before an effective industrial policy can be developed. This document contains the minutes of the symposium in the form of a summary and the statements of the speakers.

PB82-170523/GAA PC **A04**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Winged Bean: A High-Protein Crop for the Tropics (Second Edition).
Final rept.
1981, 59p CIR/BOSTID/37
Contract AID/ta-C-1433
Library of Congress catalog card no. 81-83415.

Keywords: *Leguminous plants, *Tropical regions, Agronomy, Taxonomy, Climate, Soils, Nutritive value, Cultivation, Seeds, Pests, Plant diseases, Winged bean.

In 1975 the National Academy of Sciences published a report on the winged bean, Psophocarpus tetragonolobus. At that time the plant was a little-known tropical legume grown almost exclusively in Papua New Guinea and Southeast Asia. The seemingly exceptional merits of the winged bean suggested that an in-depth examination of its characteristics and prospects be undertaken promptly. The report describes the growth characteristics, taxonomy, soils, climate requirements, pests, diseases, and nutritive value for the winged bean plant.

PB82-170846/GAA PC **A04**/MF **A01**
Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.
Social and Environmental Consequences of Natural Resources Policies with Special Emphasis on Biosphere Reserves. Proceedings of the International Seminar Held at Durango, Mexico on April 8-13, 1980.
General technical rept. (Final),
Peter F. Ffolliott, and Gonzalo Halffter. Aug 81, 64p
FSGTR/RM-88
See also PB82-170853 thru PB82-171018. Prepared in cooperation with Arizona Univ., Tucson and Instituto de Ecologia, A.C., Mexico City.

Keywords: *Natural resources, Policies, Social effect, *Environmental impacts, Land use planning, Ecology, Wildlife, Forestry, Tropical regions, Education, Farm crops, Decision making, Government policies.

The objective of this seminar was to promote international cooperation among natural resources policy makers, scientists, and educators, within the framework of the international Man and the Biosphere program. Papers on a variety of topics relating to natural resources policies formed a basis for formal and informal discussions among the participants.

PB82-172321/GAA PC **A05**/MF **A01**
National Research Council, Washington, DC.
Computer-Aided Manufacturing: An International Comparison.
Final rept.,
Hiroyuki Yoshikawa, Keith Rathmill, and Jozsef Hatvany. Jan 82, 85p*
Sponsored in part by Air Force Systems Command, Washington, DC.

Keywords: *Industrial plants, *Computers, *Technology transfer, Reviews, Trends, Forecasting, Technology, Japan, Western Europe, Comparison.

To identify useful and promising worldwide developments in computer-aided manufacturing, the Committee on Computer-Aided Manufacturing invited a team to report on the topic. They presented their findings at a day-long symposium held April 9, 1981, and in this report. Topics covered are the state of the art, development trends, and a forecast for computer-aided manufacturing in Japan, Western Europe, and Eastern Europe. The report concludes: 'The new factory that is emerging will be largely unmanned, have high operating reliability, and be almost as flexible in its capabilities as is the skilled craftsman with his hand tools...The governments of almost all industrially developed nations have recognized the crucial nature of these trends and are giving them active guidance and support. No single nation has the resources necessary to develop the factory of the future alone'.

PB82-172636/GAA PC **A03**/MF **A01**
Hawaii Univ., Honolulu. Dept. of Animal Science.
Multi-Stage Rotational Stocking and Harvesting System for Year-Round Culture of the Freshwater Prawn, Macrobrachium Rosenbergii.
Sea Grant technical rept.,
S. R. Malecha, J. Polovina, and R. Moav. Sep 81, 34p UNIHI-SG-TR-81-01, NOAA-81121707
Grants NOAA-04-8-M01-178, NA79AA-D-00085
Prepared in cooperation with Agricultural Research Organization, Israel.

Keywords: *Aquaculture, Crustacea, Management, Harvesting, Competition, Growth, Abundance, Sex, Weight(Mass), Sea Grant program, Stocking.

The drawbacks of the continuous stocking and harvesting management system that is practiced in rarely drained commercial prawn ponds are described. An alternative management system is predicated on variable density culture during growout stages, stock division, manipulation, and size-grading. Results of laboratory-level experimentation suggest that the degree of animal to animal competition that develops within populations is underestimated under the current management system; large animals suppress the growth of smaller ones which have a high compensatory growth potential once they are consistently and periodically removed into their own size-classes.

PB82-172792/GAA PC **A03**/MF **A01**
Hindustan Paper Corp. Ltd., New Delhi (India).
Exploration and Identification of Alternative Raw Materials for Paper and Newsprint Manufacture: Comparative Kraft Pulping of Eucalyptus Species (3).
Research progress rept. no. 22,
R. Pant, R. M. Mathur, Y. V. Sood, K. S. Moorthy, and A. G. Kulkarni. Oct 80, 46p

Keywords: *Paper industry, Assessments, Black liquors, Performance evaluation, Developing Country Application.

A number of species of the genus Eucalyptus have been grown in India during the last few years. These eucalypts have demonstrated their ability to grow rapidly in a wide range of climatic conditions. The object of the present investigations was to make a comparative study of the chemical pulping and paper making properties of three main Eucalyptus species, viz., E. globulus, E. grandis, and E. tereticornis, grown in Kerala state. In an overall assessment, taking pulping, pulp yield, bleaching, paper making, and black liquor properties into consideration the E. globulus was found to be the best raw material, followed by E. grandis and E. tereticornis in that order.

PB82-175027/GAA PC **A16**/MF **A01**
International New Towns Asssociation, The Hague (Netherlands).
Community Planning and Development Challenges: Energy, Environment, Water. Appendix D.
1980, 369p HUD-0002056
Grant HUD-H-5371RG

Keywords: *Community development, *Urban planning, Urban transportation, Energy, *Environmental impacts, Water supply, Japan, Kenya, Egypt, Mexico, France, Meetings.

This appendix presents 12 papers delivered at the 1980 Fourth Annual Conference of the International New Towns Association (INTA). Two papers consider energy and environmental factors involved in planning transportation for new towns, particularly in Japan and Nairobi, Kenya. One paper calls for a program of "capacity sharing" among nations and argues that INTA should play a strong role in this effort by disseminating knowledge about zoning, building codes, and the impact of regulation on urban growth. Another presentation argues that in order to solve transportation problems in a cost - effective way, land use and transportation must be coordinated. A Brazilian paper discusses relationships between urban structure and the use and conservation of energy. In addition, two papers focus on alternative energy technologies in Mexico and France. Two discussions of Egypt examine site selection for settlements in arid zones and new growth outside the narrow Nile Valley. A description of Dodoma, the capital of Tanzania, and of the plan for its phased growth precede another paper which concludes that new technology and better methds of planning and management must occur to conserve energy, water, and the environment. A final paper recommends a policy of national decentralization in developing countries that are experiencing "hyper - urbanization." Tables, diagrams, and maps are provided in some of the papers.

PB82-175944/GAA PC **A08**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.

Design of Concrete Walls with Shear Failure (Diseno de Muros de Concreto con Falla por Cortante),
Oscar Hernandez Basilio. Dec 80, 171p 433
Text in Spanish.

Keywords: *Buildings, *Concrete, *Earthquakes, Concrete structures, Shear strength, Mechanical hysteresis, Lateral pressure.

As a result of an exprimental program the hysteretic behavior of concrete walls with shear failure is discussed and a method for the prediction of shear wall strength is proposed. The method takes into account several variables whose effect had not been sufficiently studied. Calculate strength is compared with the results of shear wall test carried out in different research programs and an excellent approximation is found. Also, step by step analysis under actual earthquakes were carried out in order to show the behavior of the model which described the hysterisis loops under lateral loads of concrete walls under high shear forces.

PB82-177486/GAA PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Solar- and Wind-Powered Irrigation Systems,
Robert V. Enochian. Feb 82, 34p* AER-482

Keywords: *Irrigation, *Wind energy, *Solar water pumps, Windpower utilization.

Five different direct solar and wind energy systems are technically feasible for powering irrigation pumps. However, with projected rates of fossil fuel costs, only two may produce significant unsubsidized energy for irrigation pumping before the turn of the century. These are photovoltaic systems with nonconcentrating collectors (providing that projected costs of manufacturing solar cells prove correct); and wind systems, especially in remote areas where adequate wind is available.

PB82-178948/GAA PC **A09**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Div. of Surveillance, Hazard Evaluations and Field Studies.
Work Practices Guide for Manual Lifting.
Technical rept.
Mar 81, 196p DHHS/PUB/NIOSH-81-122

Keywords: *Materials handling, Hoisting, Hazards, Human factors engineering, Performance, Epidemiology, Physiology, Physiological psychology, *Occupational safety and health.

Research on the hazards of manual materials handling in industry is summarized and recommendations to reduce the human and economic burden imposed by improper materials handling are provided. Epidemiological, biomechanical, physiological, and psychophysical criteria are discussed for establishing work practice guidelines. Recommendations regarding the safe load weight, size, location and frequency of handling are presented along with mitigating factors such as worker training and physical fitness. Worker training and selection criteria are listed, and engineering guidelines are provided for the design of workplaces where manual materials handling is performed.

PB82-179409/GAA PC **A02**/MF **A01**
State Univ. of New York at Albany. Research Foundation.
Characterization of Polysaccharide Vaccines.
Rept. for 30 Jun 78-29 Sep 81,
Benjamin Chu, A. DiNapoli, R. Schneerson, J. B. Robbins, and T. Y. Liu. Feb 82, 22p FDA/BB-82/54
Contract FDA-223-78-1202

Keywords: *Vaccines, *Health, Purity, Physicochemical properties, Guidelines, Characteristics, Tests, Analytical methods.

The safety, purity, and potency of bacterial capsular polysaccharide vaccines are best measured by physico-chemical techniques to avoid the time-consuming and expensive animal testings. Because of this, the Bureau of Biologics has developed guide-lines for the release of polysaccharide vaccines based primarily on physico-chemical analyses to establish their potency and purity. A physical method which would permit one to determine the fundamental molecular parameters of the polysaccharide vaccines, such as molecular weight, radius of gyration, thermodynamic and hydrodynamic interactions, and translational diffusion coefficient has been developed. The approach to the project had been three-fold: (1) improvement of instrumentation in order to optimize the parameters of interest specifically for polysaccharide, (2) development of a new method of time correlation profile analysis in order to determine the translational diffusion coefficient of the species of interest, and (3) the use of tRNA as a model polyelectrolyte which permitted one to observe four characteristic times which could be attributed to translational and rotational motions, charge fluctuations and quasilattice motions.

PB82-181223/GAA
(Order as PB82-181199/GAA, PC **A03**/MF **A01**)
National Marine Fisheries Service, Charleston, SC. Charleston Lab.
Frozen Storage Stability of Whole and Headless Freshwater Prawns, 'Macrobrachium rosenbergii',
Malcolm B. Hale, and Melvin E. Waters. Dec 81, 4p NOAA-82011202-3
Included in Marine Fisheries Review, v42 n12 p18-21 Dec 81.

Keywords: *Aquaculture, *Food storage, Temperature, Acceptability, Texture.

The freshwater prawn, Macrobrachium rosenbergii, is being increasingly cultured in tropical regions and has aquacultural potential in temperate zones. In this study, frozen glazed prawns were stored whole (both raw and precooked) and deheaded (raw) for 9 months at -20C. Chemical, physical, microbiological, and sensory evaluations were made at intervals during storage. All samples had a firmer texture after 3 months of frozen storage, but the samples stored and cooked whole had a consistently softer texture than those stored as tails. This was due more to the prawns being boiled whole than to changes during frozen storage.

PB82-184870/GAA PC **A07**/MF **A01**
National Inst. on Alcohol Abuse and Alcoholism, Rockville, MD.
National Drug and Alcoholism Treatment Utilization Survey: Comprehensive Report.
Jun 81, 137p* NIAAA/NCALI-82/6

Keywords: *Health manpower, *Alcoholism, *Drugs, *Health, Statistical data, Surveys, Education, Comparison, Health manpower education, Funds, Training programs.

The 1980 National Drug and Alcoholism Treatment Utilization Survey (NDATUS) was the second annual joint survey conducted by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) and the National Institute on Drug Abuse, and included all known alcoholism, drug, and combined alcoholism and drug treatment units in the U.S., in both the public and private sectors. Data were also provided by the District of Columbia, Puerto Rico, Guam, the Trust Territories, and the Virgin Islands. In this Comprehensive Report, analyses of data are presented concerning funding, treatment capa-cities and utilization, staffing, and comparisons of data from the 1979 and 1980 NDATUS surveys. State data tables, a copy of the 1980 NDATUS survey form, and a glossary of terms used in the survey are appended. A separate Manpower Report, one of three reports prepared by NIAAA from the NDATUS, includes more detailed data regarding staffing and analyses of manpower issues.

PB82-184888/GAA PC **A11**/MF **A01**
Cambridge Systematics, Inc., MA.
Impacts of Downtown Revitalization Projects on Small Business.
Final rept.,
Daniel McFadden. Mar 82, 240p
Grant SB-1A-00018-01-0

Keywords: *Economic development, Government policies, Urban areas, Economic analysis, Time series analysis, *Small businesses, *Industrial development.

An analysis will be made of the downtown retail redevelopment efforts in seven cities to assess how different policies and programs affect the growth, entry, and exit of small firms. Emphasis is placed on evaluating the competitive environment of small individual firms relative to chain stores and larger firms. The objective of the study is to provide evidence which will aid the SBA in its efforts to advocate Federal, State and local policies that will confer benefits equitably on smaller firms.

PB82-185224/GAA PC **A12**/MF **A01**
Economic Consulting Services, Inc., Washington, DC.
Study of the Feasibility of Using Export Associations to Promote Increased Exports by Small Businesses: Including Survey Results from the Machine Tool; Jewelry; and Dolls, Toys and Games Industries.
Final rept.,
Clark Chandler. 10 Mar 82, 274p
Grant SB-1A-00009-01-0

Keywords: *International trade, *Machine tools, Promoting, Machine tool industry, Organizing, International trade, *Small businesses, Jewelry industry, Toys.

The study will determine whether or not the development of export trading companies seems likely to be a promising approach to stimulate increased exports by small businesses. This study will also identify under what conditions small businesses will be willing to form export associations.

PB82-185844/GAA PC **A02**/MF **A01**
National Building Research Inst., Pretoria (South Africa).
Corrosion in Sewers,
A. F. G. Rossouw. 1 Nov 79, 18p

Keywords: *Corrosion, *Pipes, *Sewage disposal, Sewer pipes, Manholes, Concrete pipes, Corrosion prevention.

Corrosion takes place in sewers when aggressive liquids come in contact with pipes and manholes. Acidic effluent attacks concrete and portland cement mortar while sulphuric acid, produced from hydrogen sulphide formed in the effluent, attacks materials of construction above the water line. Sulphates are aggressive to concrete made with ordinary portland cement which has a high alumina content. Corrosion of metals can also occur, e.g. manhole step irons. Sewer corrosion is the attack above the waterline on pipes and manholes by sulphuric acid produced by bacterial action. The characteristics of sewage which are likely to increase this type of corrosion are given. The efficacy of means of prolonging the effective life of concrete pipes and manholes is discussed.

PB82-185869/GAA PC **A03**/MF **A01**
National Building Research Inst., Pretoria (South Africa).
Corrosion of Architectural and Structural Metals and Metal Coatings in South Africa,
B. G. Callaghan. 1982, 28p

Keywords: *Corrosion, *Metals, *Aluminum, *Zinc, Structural steels, Stainless steels, Corrosion tests, Metal coatings, Data, Corrosion resistance, Lead coatings, Zinc coatings, Aluminum coatings, Cadmium coatings, Tin coatings, Steel Cor-Ten, Steel 430, Steel 304, Steel 316.

The corrosion of structural steelwork in buildings, bridges and other forms of construction results in an enormous wastage of metals, manpower and economic resources of the country. The costs are astronomical, yet this wastage continues. In an attempt to provide guidance to architects, engineering and corrosion consultants on how to deal with the problem, the CSIR has carried out extensive long-term atmospheric corrosion programs, over many years, to evaluate the performance of metals, alloys and metal coatings. Various outdoor exposure sites have been selected throughout the country and the results presented here are part of an ongoing research program of the National Building Reserch Institute into the weathering of such materials.

PB82-186685/GAA PC **A16**/MF **A01**
Enviro Control, Inc., Rockville, MD.
Control Technology Assessment of Raw Cotton Processing Operations.
Final rept.
15 Jun 80, 367p NIOSH-210-78-0001
Contract PHS-NIOSH-210-78-0001

Keywords: *Environmental surveys, *Cotton, *Textile industry, Exposure, Toxicity, Inspection, Hazardous materials, Contaminants, Environments, Protective clothing, Ventilation, *Toxic substances, *Occupational safety and health, Air pollution control.

Cotton dust control technology was assessed by conducting preliminary and detailed surveys of cotton ginning, cotton seed processing, yarn manufacturing, knitting, fabric weaving and waste processing operations that use raw cotton. The facilities surveyed used control technology involving local and general exhaust ventilation air filtration equipment, work practices, process enclosure or isolation, personal protective equipment and liquid oversprays. Cotton dust sampling equipment was tested for comparison purposes, and installation and maintenance costs of dust control machinery and equipment were evaluated. The author concludes that engineering techniques have not been applied effectively in many of the raw cotton and cottonseed processing areas. He recommends that a methodology for a systems approach to control techniques be developed within the cotton industry; that control techniques for facility scale levels be designed; that the existing cotton grading system be expanded to include the potential for dust emission during processing; that better air cleaning equipment for each segment be developed; and that techniques for growing, harvesting and ginning that will produce cleaner cottons be developed.

PB82-186859/GAA PC **A06**/MF **A01**
Indian Society of Earthquake Technology, Roorkee.
Manual of Earthquake Resistant Non-Engineered Construction.
1981, 114p

Keywords: *Building materials, Construction materials, Structural design, Guidelines, Foundations, Structural analysis, *Earthquake engineering.

The non-engineered constructions in stone, brick, adobe, and composite systems with wood, concrete or steel pose a serious damage-risk problem in seismic belts of the earth. Most losses of life during earthquakes have occurred due to the collapse of this type of buildings. It is unfortunate that this risk is increasing, rather than decreasing, in most countries on account of rising population, poverty of the people, scarcity of wood, cement and steel, lack of understanding of earthquake resistance features, etc. The increasing magnitude of seismic risk to life could be imagined by the fact that number of dwelling units and other related small scale constructions may double itself in the next 25-30 years due to the explosion of population in India and other developing countries. There is thus a great urgency that the know-how of inexpensive earthquake resistance measures in such constructions should be propagated very quickly and by simple illustrations, so that these techniques could find application at least in the new constructions. This publication is aimed at fulfilling this urgent need of providing the relevant information for ready use to not only the architects and engineers but also the public and private builders who may not have the necessary technical background.

PB82-189267/GAA PC **A02**/MF **A01**
Agricultural Marketing Service, Washington, DC.
Design, Operation, and Feasibility of a Small on-the-Farm Egg Grading and Packing Plant.
Final rept.,
Clarence E. Harris. Nov 80, 21p USDA/AMS-82/02, MARKETING/RR-1112

Keywords: *Plant layout, *Farming, *Food processing, Construction costs, Cost analysis, Marketing, Agribusiness.

This report presents a description and layout of an on-the-farm egg processing plant, designed to handle 35 cases of eggs (30 dozen per case) per hour, along with a cost analysis for construction and operation of the plant.

PB82-189762/GAA PC **A02**/MF **A01**
New York Sea Grant Inst., Albany.
Development of Products from Underutilized Species of Fish: Retail Market Tests of Canned Pollock.
Booklet,
R. C. Baker, and C. A. Bruce. Nov 81, 22p NYSG-B-10, NOAA-82021913

Keywords: *Marketing, *Seafood, *Fishes, Demand(Economics), Sales, Tunas, Sea Grant program.

Canned pollock was test marketed in four supermarkets in a small city in upstate New York. In terms of consumer response to the product, the canned pollock must be considered highly successful. Of 70 consumers who were interviewed, 83% would like to see commercial production of canned pollock, 9% qualified their positive response by adding a statement to the effect that it would have to be cheaper than tuna. Only 7% saw no value in having pollock commercially produced. Repeat sales figures support the popularity of the canned pollock with 86% of those interviewed having purchased the product more than once. This indicates that the potential for commercial production of canned pollock is excellent.

PB82-190497/GAA PC **A02**/MF **A01**
Veterans Administration, Washington, DC.
Formation of Stat Team to Handle Incidents Involving Assaultive/Disturbed Patients.
Marta Figueroa. Dec 80, 24p VA/NPR-157

Keywords: *Health, Psychiatry, Hospitals, Planning, Specialized training, *Health manpower, Inpatient care, Crisis intervention.

This report considers the formation of a Stat Team to help deal with assaultive/disturbed patients in the inpatient units, especially in psychiatry, of the Miami Veterans Administration Medical Center. The mechanics of instituting such a program are described, including forming and training the team, defining its functions, and calling the team within the restraints of the hospital communication system. A bibliography of works on disturbed behavior, a questionnaire sent to volunteers for the team, a psychiatric emergency flow sheet, and an outline of a course in management of assaultive behavior are included.

PB82-190760/GAA PC **A25**/MF **A01**
National Inst. on Drug Abuse, Rockville, MD. Div. of Research.
Problems of Drug Dependence, 1981. Proceedings of the Annual Scientific Meeting (43rd), The Committee on Problems of Drug Dependence, Inc.,
Louis S. Harris. Apr 82, 583p* NIDA/DR-82/01, RESEARCH MONO SER-41
See also report for 1980, PB81-194847.

Keywords: *Drugs, *Health, Psychiatry, Sociology, Epidemiology, Clinical medicine, Pharmacology, Rehabilitation, Laboratory animals, Research, Psychopathology, Psychotherapy, Toxicology, Narcotics, Alcoholism, Drug receptors, Drug abuse, Drug users.

The set of proceedings comprises the papers and reports presented before the 43rd Annual Scientific Meeting of the Committee on Problems of Drug Abuse, Inc., in San Francisco July 12-15, 1981. Included are comprehensive reviews of current research in all aspects of drug abuse and drug dependence and annual progress reports on NIDA-supported dependence studies on new compounds. Topics include the effects of drugs on the central nervous system, their pharmacological action, biological disposition, abuse potential, and clinical usefulness. Extensive author and subject indices are appended.

PB82-191487/GAA PC **A03**/MF **A01**
Department of Commerce, Washington, DC. Office of Administrative Services and Procurement.
Productivity Management Handbook.
1973, 34p* FSWEC-77/0192-1
For system on magnetic tape, see PB82-191495.

Keywords: *Management techniques, *Management planning, *Productivity, Regression analysis, Forecasting, Manpower, Computer programming, Documentation.

The Productivity Management program makes it possible to project accurate statistical estimates of short-range and long-range manpower and other resource requirements necessary to perform functions. The program is designed to meet the demanding changes in workloads and variables. Performance is continually monitored by a productivity index and variations exceeding acceptable tolerances are quickly recognized. The goal of the program is to achieve maximum economies and improve the current levels of service by making it possible to project manpower and other resource needs. The program consists of source statements for input into the OMNITAB program (available directly from NBS). This Handbook sets forth the necessary steps for system installation, opportunities for its use and resulting benefits which may be expected.

PB82-193434/GAA PC **A03**/MF **A01**
Bureau of Mines, Reno, NV. Reno Research Center.
Improvements in Heap Leaching to Recover Silver and Gold from Low-Grade Resources.
Rept. of investigations/1982,
G. E. McClelland, and J. A. Eisel. Feb 82, 33p* BUMINES-RI-8612
Library of Congress catalog card no. 81-607060.

Keywords: *Natural resources, *Leaching, *Metals, Precious metal ores, Agglomeration, Cyaniding(Beneficiation), Portland cements, Hydrometallurgy, Heap leaching.

A particle agglormeration technique was investigated as a means for improving the flow of leaching solution through heaps of clayey or finely crushed, low-grade, gold-silver ores. Bench- and pilot-scale experiments showed that the percolation rate of cyanide leaching solution was markedly enhanced by mixing the ore with a portland cement binder, moistening the mixture, and mechanically agglomerating and aging the feed prior to heap building and leaching. The rate of gold and silver recovery markedly increased because of the increased, uniform percolation of leaching solution through the agglomerated feed. The use of concentrated cyanide solution instead of water during the agglomeration procedure decreased the leaching time required to obtain maximum recovery. Results of bench- and pilot-scale experiments are discussed.

PB82-195116/GAA PC **A12**/MF **A01**
National Inst. of Health and Family Welfare, New Delhi (India).
Tribal Enterprise Development.
Mar 82, 274p* EDA-82-0033
Grant EDA-07-06-02431-40
Portions of this document are not fully legible.

Keywords: *Economic development, *Technical assistance, Project management, Financing, Evaluation.

The primary objective for the Tribal Enterprise Development Program for 1980-81 was to create or expand five tribal economic development projects. The Tribal Enterprise Development Program was divided into three phases; project assessment, selection, development and implementation.

PB82-196270/GAA PC **A15**/MF **A01**
Resources for the Future, Inc., Washington, DC.
Materials Requirements and Economic Growth: A Comparison of Consumption Patterns in Industrialized Countries.
Rept. for Jul 77-Feb 81,
S. Victor Radcliffe, Leonard L. Fischman, and Radford Schantz, Jr. 18 Dec 81, 334p BUMINES-OFR-31-82
Contract J0177118

Keywords: *Economic development, Consumption, West Germany, Japan, Great Britain, United States, Materials recovery, Production, Recycling.

This study concerns the national consumption of non-energy materials of all types in relation to economic growth. A quantitative method of measuring materials consumption by industry and consumers was developed for major individual materials and materials as a whole. This method accounted for the net trade flows of materials incorporated in manufactured consumer and capital goods and for the recycling of materials contained in scrap. The principal factors that have determined materials consumption intensities in relation to economic output over the historical development of the advanced industrialized countries were identified by relying on comparison of the experiences of four countries: the Federal Republic of Germany, Japan, the United Kingdom, and the United States.

PB82-196510/GAA PC A03/MF **A01**
Texas Transportation Inst., College Station.

Special Traffic Management Requirements for Maintenance Work Zones on Urban Freeways.
Research rept. Sep 77-Jun 81,
Stephen H. Richards, and Conrad L. Dudek. Jan 82, 49p TTI-2-18-78-228, FHWA/TX-82/1-228-8
Sponsored in part by Texas State Dept. of Highways and Public Transportation, Austin.

Keywords: *Pavements, *Maintenance, *Roads, Traffic safety, Traffic control, Access roads, Ramps, Frontage roads, Texas.

This report identifies and describes the special traffic handling requirements for maintenance work zones on urban freeways. These special requirements stem from the high speeds, heavy traffic volumes, and unique design features (e.g., ramps and frontage roads) which characterize urban freeways. This information and guidelines presented herein are based on field studies and interviews conducted at over 50 work zones in six Texas cities. Recommended procedures and devices for managing traffic at entrance and exit ramps and on frontage roads during freeway maintenance activities are presented. Special requirements for traffic control personnel, including Traffic Control Coordinators, Traffic Control Specialists (flagmen), and police, are discussed. The report also discusses the importance of advance public notification of freeway work activities and identifies several effective techniques for advance notification.

PB82-196536/GAA PC **A06**/MF **A01**
Texas Transportation Inst., College Station.
Construction of Fly Ash Test Sites and Guidelines for Construction.
Interim rept. Sep 78-Oct 81,
William B. Ledbetter, David J. Teague, Robert L. Long, and Billy N. Banister. Oct 81, 120p TTI-2-9-79-240-2, FHWA/TX-81/40-240-2
Sponsored in part by Texas State Dept. of Highways and Public Transportation, Austin.

Keywords: *Concrete, *Pavements, *Cement, *Construction, Concrete pavements, Concrete structures, Soil stabilization, Construction, Dust control, Guidelines.

This report summarizes the construction and initial evaluation of 12 full-scale test sites incorporating fly ash as a partial replacement for (a) lime in subgrades and bases (8 sites), (b) portland cement in concrete pavements (3 sites) and (c) portland cement in a concrete box culvert (1 site). Each site consisted of several test sections of differing designs. Conclusions reached included (1) lime-fly ash stabilization of clay type soils is effective and easily constructed, (2) replacing up to 25 percent of portland cement with high lime fly ash on a 1:1 basis resulted in no loss of strength nor any construction problems. In addition to summarizing the construction and evaluation of the test sites, specific guidelines for construction of highways using fly ash are given.

PB82-198045/GAA PC **A09**/MF **A01**
California Univ., Berkeley.
Assessment of High Heat-Transfer Evaporators as Power Plant Condensers to Produce Abundant Freshwater,
Alan D. K. Laird, Joseph Frisch, and Edward Ensler. 1982, 189p W82-03949, , OWRT-C-00070-S
Contract DI-14-34-0001-0444

Keywords: *Electric power, *Desalination, *Heat transfer, Assessments, Feasibility, Design criteria, Computer programs, Desalting, Fortran, Economics, TEMPER computer program.

Energy requirements to produce abundant freshwater from saline water sources suggests the use of high heat-transfer evaporative condensers in power plants where sufficient waste heat is available for distillation. Review of current existence of such dual-purpose plants as well as a discussion of planning for future designs is presented. Computer programs utilizing available engineering equations and cost analysis for multieffect distillation plants have been developed and are presented with example problems. They are particularly useful for analysis of existing designs, and an additional computer code for optimization of new designs has been developed. The examples show appreciable improvement in lowering unit water cost of the product, as well as adjusting such variables as temperature, mass flow rates and evaporator areas. Preliminary computerized calculations show that a two-effect evaporator unit condensing 7 million pounds per hour of steam from a 1,000 MW power plant would produce 23 million gallons per day of freshwater at a cost of less than $1 per thousand gallons.

PB82-199613/GAA PC **A10**/MF **A01**
Institute of Medicine, Washington, DC.
Marijuana and Health.
Final rept.
Dec 81, 204p* ISBN-0-309-03236-9, NIH-80-304
Contract N01-OD-0-2114
Library of Congress catalog card no. 81-86534.

Keywords: *Health, *Drugs, Respiratory system, Physiological effects, Psychological effects, Humans, Pharmacology, Cardiovascular system, Brain, Behavior, Sociology, Therapy, Research, Biological effects, Federal government, Toxic substances.

The assessment of knowledge of the health-related effects of marijuana is important and timely because marijuana is now the most widely used of all illicit drugs available in the United States. The scientific evidence published to date indicates that marijuana has a broad range of psychological and biological effects, some of which, at least under certain conditions, are harmful to human health. Unfortunately, the available information does not tell us how serious this risk may be. This report recommends that there be a greatly intensified and more comprehensive program or research into the effects of marijuana on the health of the American people.

PB82-199910/GAA PC **A04**/MF **A01**
Michigan Univ., Ann Arbor. Inst. for Social Research.
Use of Information in Innovating Processes by Local Governments: Final Report.,
Donald C. Pelz. Nov 81, 70p* NSF/ISI-81005
Grant NSF-ISI79-20575
See also PB82-199795.

Keywords: *Technology transfer, *Information services, Materials recovery, Technological intelligence, Information dissemination, Energy conservation, Waste recycling, Noise pollution abatement, Noise reduction.

The study examines how cities and counties make use of information in adopting innovations. Conducted in consultation with five national associations of local government officials, the project sought ways of improving these associations' information sevices on innovations. From telephone interviews in 18 cities and counties on the process of adopting energy conservation, solid waste resource recovery, or noise control innovations, data were obtained on what kinds of innovating functions occurred at each point in time, what types of actors sought or supplied what kinds of information at each point, and through what channels.

PB82-200080/GAA PC **A03**/MF **A01**
Central Road Research Inst., New Delhi (India).
Lime-Fly Ash Stabilised Soil for Road and Building Constructions,
1979, 47p
Prepared in cooperation with Central Building Research Inst., Roorkee (India).

Keywords: *Roads, *Pavements, *Soils, Calcium oxides, Fly ash, Pavement bases, Subgrades.

This report is the result of a comprehensive collaborative study undertaken by Central Road Research Institute and Central Building Research Institute for stabilization of different soils with lime and flayash for use in the lower layers of pavement systems as bases/subbases in both roads and airfields, as well as manufacture of building blocks as an alternative to burnt clay bricks.

PB82-201021/GAA PC **A04**/MF **A01**
California Univ., San Diego, La Jolla. Inst. of Marine Resources.
Mariculture of Red Seaweeds,
Judith E. Hansen, Julie E. Packard, and William T. Doyle. 1981, 56p T-CSGCP-002, NOAA-82040802
Grant NOAA-04-8-M01-189
Prepared in cooperation with Stanford Univ., CA.

Keywords: *Aquaculture, *Algae, *Aquatic plants, Rhodophyta, Harvesting, History, Contamination, Biomass, Substrates, Plant reproduction, Sea Grant program, Red algae.

As new applications for using red seaweed have developed, the demand for red seaweed has increased, to the point where commercial harvesting techniques now need to be developed to lessen dependence on wild seaweed stocks. The history of red seaweed use as a food in Asia, Polynesia, Europe and North America is traced. The seaweed's nutrient value and use as animal fodder, as 'nutrient scrubbers' to clean contaminated water, and as biomass for energy is documented. Attempts to manipulate seaweed habitat using artificial substrates, live storage, and vegetative propagation are described.

PB82-201757/GAA PC **A04**/MF **A01**
Soil Conservation Service, Washington, DC. Engineering Div.
Earth Dams and Reservoirs.
Final rept.
Aug 81, 62p SCS/ENG/TR-60
Supersedes PB-260 770. Revision of report dated Jun 76.

Keywords: *Reservoirs, *Dams, Hydraulic models, Embankments, Flood control, Geologic investigations, Hydraulic structures, Design, Soil stabilization, Hydrogeology, Lakes, Ponds, Runoff, Hazards, Flexural strength, Seismology.

The Technical Release (TR) describes Soil Conservation Service design procedures and presents minimum requirements for planning and designing earth dams and associated spillways. The material is applicable to dams and reservoirs larger than ordinary farm ponds. The TR is intended for use of SCS engineers but the contents will be useful to engineers in other organizations. Hydrology requirements and data are presented for various type structures and for each of the three hazard classes. Geologic investigation requirements are covered including seismic assessments. Earth embankment and foundations are described including minimum factors of safety for embankment slope stability. Spillways are covered including hydraulic design, structural strength and stability of earth and vegetated spillways.

PB82-201807/GAA PC **A10**/MF **A01**
Industrial Technology Research and Development Foundation, Inc., Durant, OK.
Planning for Appropriate Technology, Innovation and Non-Farm Rural Development: The Case of Southeastern Oklahoma.
Final rept.,
Joe H. Mize, Larkin B. Warner, Orley M. Amos, Jr., Winfield P. Betty, and Earl J. Ferguson. Oct 81, 205p NSF/ISP-81050
Grant NSF-ISP80-20289
Prepared in cooperation with Oklahoma State Univ., Stillwater. Office of Business and Economic Research.

Keywords: *Technology transfer, *Research and development, Research projects, Rural areas, Economic development, Regional planning, Income, Technology innovation.

A project to enhance economic activity in the economically depressed area of Southeastern Oklahoma through new product innovation, new and expanded industries, and increased employment opportunities is summarized. The study was directed toward: (1) determining the appropriate technology (AT) base which currently exists; (2) evaluating how science and technology (S and T) can assist in its utilization to foster general growth and development in the region; and (3) developing a plan of operation for a research and innovation center as it supplies S and T to the region's AT base. To achieve these goals, seven specific objectives were established, including the formation of the Industrial Technology Research and Development Foundation (ITRAD). The report states the objectives, outlines tasks required to accomplish them, and discusses results based on the assessment and development phases of each objective.

PB82-203654/GAA PC **A04**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
Barter of Agricultural Commodities.
Staff rept.,

Donna U. Vogt, Cathy L. Jabara, and Dee A. Linse.
Apr 82, 65p* AGES-820413

Keywords: *Agriculture, *Crops, *International trade, Commerce, Agreements, Foreign trade.

Barter and barter-type agreements are employed by developing and centrally planned countries in trade of both agricultural and non-agricultural products. These types of agreements generally involve the exchange of goods without the transfer of international currencies. This paper answers the question 'why barter' by describing the economic and political motives behind barter agreements and by providing a sample of agreements between countries that use barter in trade. The operation of the U.S. barter program from 1950 to 1973, which arranged for exchanges of agricultural commodities for strategic materials, supplies, and services, is described, and the potential for future U.S. barter of agricultural commodities for strategic materials is examined. Results indicate that several developing countries could become key barter partners.

PB82-204421/GAA PC **A03**/MF **A01**
Valtion Teknillinen Tutkimuskeskus, Tampere (Finland). Tekstiililaboratorio.
Projected Account Conception,
Ben Malmstroem. Jan 81, 47p TIEDONANTO-21, ISBN-951-38-1130-1
Also pub. as ISSN-0355-3639.

Keywords: *Management planning, Finland, Businesses, Industries, Methodology, Applications of mathematics.

It is recognized that the managing process to a large extent means master and control of the multitude of programs or time series of activities and their interaction on all hierarchy levels. The time series are planned, reviewed for feasibility, executed, and reviewed for performance continuously in consecutive cycles by the managing process. This study focuses on the development of a basic building block or model unit for the deduction of a conceptual analogue model of the real business system with the purpose to support and formalize the managing process of plan, execute, and review, and with the requirement of being able to adapt common management techniques of applied mathematics.

PB82-204686/GAA PC **A09**/MF **A01**
Valtion Teknillinen Tutkimuskeskus, Espoo (Finland).
Bioconversion in Food Technology: Proceedings of Second Franco-Finnish Symposium on Biotechnology Held at Helsinki on 8-10 February 1978,
Pekka Linko. 1978, 196p ISBN-951-38-0629-4

Keywords: *Food, Technology, Catalysts, Enzymes, Peptides, Proteins, Economics, Beverages, Degradation, Fermentation, Activated sludge process, Pilot plants, Industrial plants, *Bioconversion, Immobilized enzymes, Cellulose.

The interesting program of the Symposium includes subjects on various areas of biotechnology. There is hope that in addition to formal presentations the Symposium would provide a stage for vivid discussions on latest research results and applications. To catalyze this, several opportunities for informal discussions have been provided.

PB82-204694/GAA PC **A06**/MF **A01**
Hindustan Paper Corp. Ltd., New Delhi (India).
Exploration and Identification of Alternative Raw Materials for Paper and Newsprint Manufacture - Pulping, Bleaching and Evaluation of Pulps from Mixed Hardwood Species from the Bastar Region.
Working document no. 29.
Jul 80, 113p
Sponsored in part by United Nations Development Programme, New Delhi (India).

Keywords: *Paper industry, Papermaking, Substitutes, Pulping, Bleaching, Manufacturing, Newsprint, Bastar Region, Developing country application.

The collection of representative samples of pulp wood from the Bastar forests, chipping, the preparation of chip mixtures representative of different diameter classes and of the forest area, and investigations into their pulping, bleaching and papermaking properties are described and discussed in this report. Attention is also given to the black liquors from the different chip mixtures and from some individual species. This report also covers the collection of bamboo from the Bastar region, its pulping and bleaching characteristics and the papermaking properties of bamboo-mixed hardwood pulp blends.

PB82-204702/GAA PC **A03**/MF **A01**
Hindustan Paper Corp. Ltd., New Delhi (India).
Exploration and Identification of Alternative Raw Materials for Paper and Newsprint Manufacture - Laboratory Methods of Chemimechanical and Chemical Pulping and Bleaching of Hardwoods.
Working document no. 23,
J. V. A. Peltonen. Sep 79, 36p
Sponsored in part by United Nations Development Programme, New Delhi (India).

Keywords: *Paper industry, Substitutes, Bleaching, Pulping, Pilot plants, Manufacturing, Cold soda pulps, Bastar region, Developing country application.

This report is given by a FAO consultant assisting: Chemi-mechanical pulping; lignin preserving bleaching of chemimechanical pulps; evaluation of bleaching sequences for hardwood draft pulps; planning and evaluation techniques of multi-variable pulping experiments; and working methods and the cooperation of staff between the organic and physical chemistry laboratories. In addition to the new methods recommended, three projects were drafted. They are: bleaching of Bastar hardwood pulps; semichemical cold soda pulps from North Bengal hardwoods; and pilot plant process parameters for Eucalyptus tereticornis alkaline sulfite CMP.

PB82-204728/GAA PC **A06**/MF **A01**
Valtion Teknillinen Tutkimuskeskus, Tampere (Finland). Tekstiililaboratorio.
Common Concept of Managing Process and Techniques,
Ben Malmstroem. Jan 81, 122p TIEDONANTO-20, ISBN-951-38-1129-8
Also pub. as ISSN-0355-3639.

Keywords: *Management planning, Organization theory, Applications of mathematics, Time series analysis, Finland, Methodology, Businesses.

The study puts into focus the question whether there is to be found a feasible formalization of the managing process, and a common denominator to bring closer together the managing process and common management techniques of applied mathematics. First, some aspects are discussed concerning administrative and organizational theory, as well as the managing process the purpose of which is to master and control the complex interactions of activity programs and time series of them. Second, a number of techniques of applied mathematics are discussed whereby the common ability of producing programs of activities along the time axis is emphasized. The attention is brought to the fact that time series of activities and operations interacting with each other seem to be the common feature and connecting link of the managing process and common techniques.

PB82-205568/GAA PC **A04**/MF **A01**
Council for Scientific and Industrial Research, Pretoria (South Africa). Technical Services Dept.
Approaches to Productivity Improvement (Mini-Seminar).
Aug 81, 72p TSD BOOK-0006/81, ISBN-0-7988-2082-9

Keywords: *South Africa, Meetings, *Productivity, Businesses, Industries, Management methods.

The report contains presentations from company and corporation executives on methods of improving productivity.

PB82-205592/GAA PC **A03**/MF **A01**
Hindustan Paper Corp. Ltd., New Delhi (India).
Refining of Pulps from Ballarpur Industries Limited, Yamunanagar.
Research progress rept. no. 13,
Y. V. Sood, K. S. Moorthy, R. K. Roy, and Y. K. Sharma. 1981, 47p
Sponsored in part by United Nations Development Programme, New Delhi (India).

Keywords: *Paper industry, Manufacturing, Substitutes, Blends, Hardwoods, Softwoods, Agricultural wastes, Papermaking, Newsprint, Developing country application.

Mixed and separate refining studies have been made for pulp blends from Ballarpur Industries Limited containing softwood (Pinus roxburghii), hardwoods, and agricultural residue pulps. Results indicate that separate or mixed refining of wood pulp (softwood and hardwood) as one component and agricultural residue pulp as another component have little effect on strength and printing properties. These are improved when the long fibred (Pinus roxburghii) pulp and the short fibred pulp (a mixture of hardwood pulp and agricultural residue pulp) are each beaten separately and then mixed to give the same blend of long and short fibred pulps. Pulp samples collected from various points in the mill have also been evaluated and are reported in an Appendix.

PB82-205683/GAA PC **A04**/MF **A01**
Multisystems, Inc., Cambridge, MA.
Free Enterprise Urban Transport.
Final Rept.,
Gabriel Roth, and George G. Wynne. Jan 82, 67p
UMTA DC-06-0150-82-1
Contract DOT-UT-90008

Keywords: *Urban planning, *Transportation, *Transportation management, Developing countries, Foreign countries, Operations, Profits, Services, Urban areas, Comparison, United States, Public transportation, Taxicabs, Minibuses, Ownership.

This report provides an overview that describes a number of public transport systems abroad, largely in developing countries, that operate at a profit, and indicates action that enable the United States to develop networks of fast, reliable urban public transport services responsive to users' needs, at prices that most can afford. Chapter 2 of this report provides examples of different types of urban public transport that run at a profit while providing good service. Chapter 3 describes the characteristics of successful urban public transport systems. Chapter 4 reviews the private provision of public transport in U.S. cities and considers the possibilities of their expansion. Chapter 5 outlines how lessons from abroad can be applied to U.S. transportation systems.

PB82-205956/GAA PC **A02**/MF **A01**
Municipal Environmental Research Lab., Cincinnati, OH.
Monitoring Water Filters for Asbestos Removal.
Journal article,
Gary S. Logsdon, James M. Symons, and Thomas J. Sorg. c1981, 13p EPA-600/J-80-167
Pub. in Jnl. of the Environmental Engineering Division, ASCE, v107 nEE6 p1297-1315 Dec 81.

Keywords: *Asbestos, *Water treatment, *Fibers, Monitoring, Amphiboles, Diatomaceous earth, Granular materials, Turbidity, Reprints.

Water filtration processes can reduce the asbestos fiber count in drinking water by 90 to 99.9 percent, or more. Effective fiber removal requires very close control of the treatment process. Monitoring of filtered water turbidity can indicate the efficacy of treatment, even though the asbestos fiber concentration is too low to register as turbidity. Turbidity monitoring works because when water is properly prepared for filtration, passage of asbestos fibers through the filter is indicated by the passage of floc, as shown by higher turbidity. Filtered water turbidity should be 0.10 ntu or below for best fiber removal. Continuous monitoring of each filter module at a treatment plant is recommended. These findings are based on studies at Duluth, Two Harbors, and Silver Bay on Lake Superior; Seattle's Tolt reservoir, and on data obtained from the San Francisco Bay area.

PB82-206400/GAA PC **A03**/MF **A01**
Hindustan Paper Corp. Ltd., New Delhi (India).
Exploration and Identification of Alternative Raw Materials for Paper and Newsprint Manufacture - Maintenance of Pilot Plant Equipment.
Working document no. 24,
J. Helve. Sep 79, 28p
Sponsored in part by United Nations Development Programme, New Delhi (India).

Keywords: *Paper industry, Manufacturing, Equipment, Pilot plants, Substitutes, Design criteria, Developing country application.

This report documents the activities of a consulting group which inspected the maintenance facilities, workshop layout, tools, and equipment of a pilot plant. For the organizing of maintenance and repair work a systematic approach was introduced comprising of the use of specially prepared machine cards, lubrication instructions, and repair and maintenance cards. Abbreviated operating and maintenance instructions were compiled on the basis of machine and equipment manuals. Drafting and finalizing of a number of construction details in the pilot plant is also documented.

PB82-206525/GAA PC **A13**/MF **A01**
Ahmedabad Textile Industry's Research Association (India).
Information Needs of the Textile and Allied Industries in India.
Survey rept.
Mar 80, 282p
Portions of this document are not fully legible.

Keywords: *Textile industry, *India, *Information systems, Questionnaires, Surveys, Methodology, Developing country application.

A questionnaire was sent out to Indian textile manufacturers inquiring about their information needs. More than 100 responded. This book is a compilation of the results of that survey. The conclusions were that a need was felt among all the respondents for almost every information service that the questionnaire posited, including the need to establish a National Information center for textile research. The center would collect and translate worldwide information about textiles and provide an awareness service through periodic publications as well as standard library services.

PB82-206566/GAA PC **A03**/MF **A01**
Central Pulp and Paper Research Inst., New Delhi (India).
Refining Studies on Mill Pulps from Star Paper Mills Limited, Saharanpur.
Research rept.,
Y. K. Sharma, Y. V. Sood, T. C. Mantri, and K. S. Moorthy. May 81, 29p CPPRI/RR-7/81

Keywords: *Pulp, *Paper industry, Comparison, Mechanical properties, Developing country application.

Investigations were undertaken to study the refining properties of mill pulp. The objective was to ascertain if the strength of the refined pulp could be improved utilizing the disc refiners available in stock preparation. It was also to investigate the possibility of increasing the throughput while utilizing the disc refiners. For comparison, refined pulps collected from various stages using different combinations of refiners were also evaluated. The final results indicated the possibility of improving the strength characteristics and increasing the throughput by removing dams partially.

PB82-206574/GAA PC **A04**/MF **A01**
National Buildings Organisation, New Delhi (India).
Housing Construction Techniques and Termite Control: Precast Cellular Unit Floor/Roof for Low Cost Housing.
Jul 78, 56p

Keywords: *Construction, *Houses, *Buildings, Precast concrete, Cellular materials, Roofs, Floors, Structural members, Reinforced concrete, Bricks, Termites, Developing country application, Low cost housing.

This series of reports covers precast cellular unit floor/roof for low cost housing, precast RC channel units for low cost housing, RCC frames for doors and windows, brick cavity walls (using common burnt clay bricks), and termite control in buildings. All the reports are written in simple English and contain clear drawings and charts to help the home builder.

PB82-206640/GAA PC **A03**/MF **A01**
Ahmedabad Textile Industry's Research Association (India).
Work Study - Cases in Textiles.
Circular rept.,
S. P. Patel, K. Subrahmanyam, and S. B. Vaidya. Feb 76, 30p ENG-77

Keywords: *Textile industry, Manufacturing, Performance evaluation, Industries, Developing country application.

Work study is a management tool to improve efficiency without big capital expenditure. This report covers three cases in which substantial benefits were obtained through work study: Transport of bales to the blow room; low productivity and high waste in a thread mill; and production loss in a drying machine. In each case the present situation was reviewed, suggestions were presented, and the advantages of the suggestions pointed out.

PB82-206657/GAA PC **A02**/MF **A01**
Hindustan Paper Corp. Ltd., New Delhi (India).
Exploration and Identification of Alternative Raw Materials for Paper and Newsprint Manufacture - Planning, Execution, Evaluation and Reporting of Laboratory Pulping and Bleaching Studies.
Working document no. 25,
A. J. Watson. 1981, 15p
Sponsored in part by United Nations Development Programme, New Delhi (India).

Keywords: *Paper industry, Substitutes, Pulping, Bleaching, Papermaking, Developing country application.

This is a working report given by the consultant from FAO to a pulping and bleaching laboratory in India to show how to plan, execute, evaluate, and report studies better and more efficiently. This report summarizes the work the consultant has done in the two-month period of consultancy. Suggestions for improving the work in writing laboratory reports, and checking and editing the reports are raised. Laboratory operation and testing procedures and recommendations for future work in the fields of bamboo pulps, hardwood, and papermaking properties are suggested. Also suggested are establishment of a centralized system for filing reports and experimental data, and day books to record day to day activities of a laboratory.

PB82-206665/GAA PC **A03**/MF **A01**
Ahmedabad Textile Industry's Research Association (India).
How to Assess Labour Complements in Spinning and Weaving.
Circular rept.
Sep 75, 28p MP-71

Keywords: *Textile industry, *Economic analysis, Personnel, Spinning(Staple fibers), Weaving, Management planning, Developing country application.

The profitability of a mill depends to great extent on how good a control is exercised on the direct material costs and the labor costs. Recent analysis indicates that a reduction on the order of 10% to 25% would be possible in many mills even without any further modernization of their machinery, in spinning as well as in weaving. The methods described in this report enable each mill to compute the Standard Labor Complements for its own conditions, to judge its existing strength, and to plan a program of control on labor costs through progressive rationalization.

PB82-206715/GAA PC **A04**/MF **A01**
Ahmedabad Textile Industry's Research Association (India).
Achieving the Best from Boiler, through Understanding Indian Coal,
T. R. Sarkari. Aug 79, 53p
A paper presented at the Seminar held at ATIRA on 5 Jul 79 at Ahmedabad.Portions of this document are not fully legible.

Keywords: *Boilers, *Coal, Industrial plants, Developing country application.

This report gives a basic understanding of coal and its behavior to industrial users so that they can use coal properly. The basic structure and properties of coal are listed. Special emphasis is given to the problems posed by coal quality and the measures to solve these problems. Also discussed in the report is to what extent caking coal, fines, high ash coal, low fusion coal, and undesirable alkaline impurities in coal affect boiler output.

PB82-207093/GAA PC **A15**/MF **A01**
National Inst. for Water Research, Pretoria (South Africa).
Manual for Water Renovation and Reclamation (Second Edition).
1981, 335p*
Errata sheet inserted.

Keywords: *Waste water reuse, *South Africa, Design, Manuals, Activated carbon treatment, Clarification, Ammonia, Chemical removal(Sewage treatment), Adsorption, Chlorination, Ozonization, Sludge drying, Activated sludge process, Filtration, Pilot plants, Septic tanks, Sand filtration, Cost analysis, Biofilters.

The aim of this manual is the dissemination of information useful to design engineers, researchers and organizations concerned with the reclamation of water from wastewater. The Manual is based mainly on extensive investigations by the National Institute for Water Research on the operation of the 4 500 m3/d Stander water reclamation plant, Pretoria, on biofilter humus tank and activated sludge effluent, as well as on laboratory and pilot scale investigations. The various treatment processes, such as clarification, ammonia stripping, softening, quality equalization, stabilization, filtration, active carbon adsorption and regeneration, sludge handling, chlorination and ozonation, are discussed in detail.

PB82-207952/GAA PC **A04**/MF **A01**
Hindustan Paper Corp. Ltd., New Delhi (India).
Kraft Pulping of Coppice Grown Eucalypts.
Research progress rept. no. 23,
R. Pant, A. K. Rai, R. M. Mathur, and Y. V. Sood. Nov 80, 63p
Sponsored in part by United Nations Development Programme, New Delhi (India).

Keywords: *Chemical industry, Trees(Plants), Developing country application.

Pulping and bleaching investigations were carried out on coppice grown Eucalyptus tereticornis and Eucalyptus grandis. It was observed that bleachable grade pulps could be obtained from coppice grown eucalypts. These pulps could be bleached to 76-78% ISO brightness by the conventional CEHH sequence. When compared to main plantation grown eucalypts, the pulps produced from coppice wood showed slightly lower strength characteristics. It was also found that the black liquors from the main plantation eucalypts were characterized by lower viscosity and better burning properties than the black liquors from coppice grown woods.

PB82-208083/GAA PC **A04**/MF **A01**
Hindustan Paper Corp. Ltd., New Delhi (India).
Cod Soda Pulping of North Bengal Hardwoods.
Research progress rept. no. 18,
T. C. Mantri, V. Raghunath, and K. S. Moorthy. Apr 80, 51p
Sponsored in part by United Nations Development Programme, New Delhi (India).

Keywords: *Chemical industry, Mechanical properties, Bleaching, Castanopsia hystrix, Schima wallichii, Developing country application.

Cold soda semi chemical pulps with satisfactory strength properties can be made from Schima wallichii and Castanopsia hystrix from North Bengal. In addition a mixture of 10 hardwood species in which the two above mentioned species contribute together more than 50% also gave pulps with reasonable strength properties. These pulps however had low freeness values even in the unbeaten state. The strength properties of pulps produced from the chip mix were improved by increasing the soaking period and using higher treating temperatures. The pulps were difficult to bleach. The best result using a number of different bleaching treatments was 52% to 54% ISO.

PB82-208109/GAA PC **A03**/MF **A01**
Hindustan Paper Corp. Ltd., New Delhi (India).
Pulping Characteristics of Lops and Tops from Five Central Indian Hardwoods (Bastar Area).
Research progress rept. no. 14,
R. Pant, N. R. Mohan Rao, R. M. Mathur, A. G. Kulkarni, and S. Bharti. 1981, 29p
Sponsored in part by United Nations Development Programme, New Delhi (India).

Keywords: Central Indian Forests, Bastar Region, Developing country application.

Investigations were carried out on pulping of bottom, middle, top and branch portions of five hardwood species from the Central Indian forests. These were Shorea robusta, Terminalia tomentosa, Pterocarpus mersupium, Diospyros melanoxylon, and Anogeissus latifolia. Black liquors obtained from cooks from the different portions of the trees were also studied with respect to viscosity and precipitation characteristics during evaporation. It was observed that there were only very slight differences in the pulp and the black liquor characteristics from the different portions of the tree. It was concluded that the use of the lops and tops in the hardwood mixture would not have significantly adverse effects on pulp yield, Kappa number, pulp strength characteristics, or the black liquor properties.

PB82-208240/GAA PC **A16**/MF **A01**
Missouri Univ.-Rolla. Rock Mechanics and Explosives Research Center.
Investigation of the Interaction of Rock and Types of Rock Bolts for Selected Loading Conditions (Una Investigacion de la Interaccion de la Roca y los Tipos de Pernos para Roca para Condiciones de Carga Seleccionadas),
Charles J. Haas, H. Dean Keith, Ray N. Nitzsche, Dave Janakkumar, and Richard L. Hoffman. 1982, 364p
Contract H0122110
Text in Spanish. See also English version PB-267 672.

Keywords: *Coal, *Mining, Tensile stress, Grouting, Rock mechanics, Anchoring, Finite element analysis, Stress analysis, Developing country application, Roof bolts, Mine safety.

This research investigated the interaction phenomena of rock and types of rock bolts needed to develop design principles for using grouted roof bolts. The investigation was both to determine the effectiveness of grouted bolts in resisting lateral displacement and axial separation along fracture planes, and if grouted bolts eliminate the axial tensile stress near the anchor and the resulting rock fracture. The first year objective, which involved defining the post tensioning response of grouted bars and determining the amount of shear resistance generated by conventional and resin-grouted bolts, was achieved. The second year objectives were to make additional shear tests, conduct creep tests, and continue the theoretical analysis of the support mechanics of rock bolts. Finite-element analysis showed that high stress concentrations are created when an expansioned-anchor bolt separates. The stress distribution in a mine roof structure which is not subjected to lateral loading is not affected significantly when bolts are installed. (In Spanish).

PB82-208380/GAA PC **A02**/MF **A01**
Central Food Technological Research Inst., Mysore (India).
Comparative Evaluation of Some Storage Bins for Rural Grain Storage,
T. S. Krishnaumurthy, and S. K. Majumder. 1978, 18p
Pub. in Jnl. Ind. Acad. Wood Sci., v9 n1 p1-16 Jan-Jun 78.

Keywords: *Grains(Food), *Food storage, *India, Thermal conductivity, Moisture, Condensation, Termites, Rodents, Insects, Cost analysis, Plywood, Polyethylene, Metals, Panels, Ferrocements.

The main requirements for sound storage of food grains are that their moisture content should be below 11 percent and that they should be free from internal infestation. Grain storage structures should therefore have (1) low thermal conductivity to prevent moisture condensation in stored grain, (2) gas-worthiness for fumigant retention, (3) resistance to rodent and termite attack, and (4) resistance to cross-infestation by insects. A comparative evaluation of plywood, ferrocement and high molecular weight high density polyethylene bins of capacity 0.5 to 3 tons showed that the plywood and ferrocement bins meet these requirements both for indoor and outdoor storage of grains.

PB82-208497/GAA PC **A02**/MF **A01**
Hindustan Paper Corp. Ltd., New Delhi (India).
Cold Soda Pulping of Mixed Hardwoods from the Central Indian Forest (Bastar Region), Preliminary Study.
Research progress rept. no. 12,
T. C. Mantri, Y. K. Sharma, V. Raghunath, Y. V. Sood, and K. S. Moorthy. Sep 79, 23p
Sponsored in part by United Nations Development Programme, New Delhi (India).

Keywords: *Wood, *Chemical industry, Mixtures, Newsprint, Paperboards, Central Indian Forest, Bastar Region, Developing country application.

Three mixtures of hardwoods of diameter class 2 (11-30 cm over bark, breast height) from the Bastar area were processed for cold soda pulping in the laboratory to study the effect of chemical treatment on the physical properties of these pulps. The findings show that the mixture of hardwoods from the Bastar area may not be suitable for newsprint (prepared from the cold soda process in the yield range of 83-88%). However, cold soda pulps can be used for the manufacture of different grades of paper boards. Hypochlorite bleaching of cold soda pulps has no advantage to get the required brightness level.

PB82-208505/GAA PC **A03**/MF **A01**
Ahmedabad Textile Industry's Research Association (India).
Papers Presented at the One-Day Technical Seminar on 'Textiles' Held at Surat on 30 November 1975,
A. R. Garde, and M. C. Paliwal. Nov 75, 45p

Keywords: *Textile industry, Chemical engineering, Weaving, Textile processes, Spinning(Extruding), Developing country application.

Papers presented at the one-day technical seminar on textiles are 'Higher Profits Through Technological Controls in Spinning and Weaving', 'Analyses of Productivity in Spinning and Weaving', 'Studies in Chemical Processing of textiles', and 'Engineering Research at Ahmedabad Textile Industry's Research Association Ahmedabad'.

PB82-209644/GAA PC **A15**/MF **A01**
National Research Council, Washington, DC.
Causes and Effects of Stratospheric Ozone Reduction: An Update.
Final rept.
Mar 82, 348p* ISBN-0-309-03248-2
Contract EPA-68-02-3701
Library of Congress catalog card no. 82-81229.

Keywords: *Health, *Air pollution, Cells(Biology), Chlorine organic compounds, Stratosphere, Exposure, Ultraviolet radiation, Chemistry, Molecules, Public health, Concentration(Composition), Plants(Botany), Hazards, Malignant neoplasms, Cancer, Biological processes, Ecosystems, Immune responses.

Estimates of steady-state reductions in stratospheric ozone due to continued releases of two chlorofluorocarbons (11 and 12) at 1977 rates in the absence of other perturbations are lower than 1979 estimates by a factor between two and three. Current models suggest the steady-state reduction will lie between 5 and 9 percent. The association of nonmelanoma skin cancers with ultraviolet-B radiation suggests that reductions in stratospheric ozone will result in increases of these cancers. Exposure to ultraviolet-B also has been shown to adversely affect the immune response system; further research is needed to determine the importance of this finding for understanding photocarcinogenesis.

PB82-209834/GAA PC **A06**/MF **A01**
Institute for Information Studies, Falls Church, VA.
Small Business Enterprises for Workers with Disabilities.
c1982, 122p* ISBN-0-935294-18-X
Grant NHIR-22-P-59236/3-03
Library of Congress catalog card no. 81-23733.

Keywords: *Small Businesses, Discrimination, Financing, Organizing, Resources, National government, Manuals, Entrepreneurship.

The document is a self-help manual designed to provide information and resources on small business enterprises to people with disabilities. Included in this publication are chapters on small business opportunities, developing and organizing a small business, and resources available to small business through private organizations and government agencies.

PB82-210808/GAA PC **A02**/MF **A01**
Indian Plywood Industries Research Inst., Bangalore.
Economics of Production of Synthetic Resin Adhesives,
Joseph George. 1977, 21p
Pub. in IPIRI Jnl., v7 n2 p48-65 Jul/Dec 77.

Keywords: *Adhesives, *Economic analysis, Fillers, Extenders, Additives, Wood products, Developing country application.

This paper outlines a scheme for production of synthetic resin adhesives. It examines the production of various kinds of synthetic resins for wood adhesives like the Urea Formaldehyde Resin, Phenol Formaldehyde Resin, Resorcinol Formaldehyde and Phenol Resorcinol Formaldehyde Resins, Melamine Formaldehyde Resin, Epoxy Resin and Polyvinyl Acetate Resin Emulsion. The paper also describes the features of fillers, extenders and other additives. The composition, properties, and economics of synthetic resin adhesives are examined.

PB82-210824/GAA PC **A04**/MF **A01**
Ministry of Agriculture and Irrigation, New Delhi (India).
Tips on Better Farming 9.
Dec 81, 66p

Keywords: *Farming, *Crops, Recommendations, Vegetables, Fruit crops, Agricultural machinery, Fertilizers, Developing country application, Manure.

The booklet recommends new varieties of crops, fodders, vegetables, and fruits, which have showed good yields in experiment condition, and some useful farming practices which will benefit farmers. Specific crops studied are: Arhar, bajra, barley, coconut, castor, cotton, foxtail millet, groundnut, jowar, maize, mung, paddy, pepper, ragi, sarpagandhi, soyabean, sugarcane, tapioca, turmeric, vanilla, wheat. Implements and machines; manures and fertilizers; pest, disease, and weed controlling methods; and better practices for poultry and animal husbandry are also recommended.

PB82-211558/GAA PC **A03**/MF **A01**
Ministry of Agriculture and Irrigation, New Delhi (India).
Tips on Better Farming 16,
Ravi Varma. Jul 75, 45p

Keywords: *Vegetables, *Crops, *Farming, Yield, Fertilizers, Wheat plants, Plant diseases, Pest control, Weed control, Animal husbandry, India, Developing country application.

The booklet recommends new varities of crops, fodders, and vegetables which showed good yields in experimental conditions, and some useful farming practices which will benefit farmers. Specific crops studied are: Barley, Bajra, Castor, Cotton, gram, jowar, maize, rice, sugarcane, sunflower, sunhemp, sweet basil, tobacco, and wheat. Manures and fertilizers; pests, diseases, and weeds; and better practices for animal husbandry are also recommended.

PB82-211947/GAA PC **A04**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
World Sugar Model.
Staff rept.,
Roger K. Conway, Michael D. Hammig, Hosein Shapouri, and John F. Yanagida. Apr 82, 54p AGES-820429

Keywords: *Sugar, *Agricultural economics, Mathematical models, Econometrics, Sugarcane, Sugars, Supply(Economics), Demand(Economics).

This document has three parts. First, an overview of the sugar market and a general description of the mathematical programming model used are presented. Second, the theory behind the specification of regional supply, demand and stock supply, and demand is given. Finally, four appendices detail the regions, nonlinear programming, estimated regional supply and demand equations, and the data base.

PB82-212796/GAA PC **A25**/MF **A01**
Saint Louis Univ., MO. Center for Urban Programs.
Pre-Employment and Transition Services: Vocational Exploration-Interim Findings and Background.
Youth knowledge development rept. (Final).
May 80, 591p YKDR-6.1
Contract DL-99-9-2037-33-11

Keywords: *Training, *Employment, *Vocational guidance, Learning, Job analysis, Surveys, Comprehensive Employment and Training Act.

The subject of this report is the Vocational Exploration in the Private Sector program (VEPS). VEPS exposes youths to a variety of different jobs through on-site observation, instruction, and rotational assignments in various companies. The goal of the project is to enlarge participants' knowledge of the working world and basic work requirements, and to increase their potential to secure unsubsidized jobs. Under CETA regulations, youths are allowed to remain on a given job assignment only as long as it is a learning experience; that is, participants cannot contribute to the outputs or profits of a given firm. Since the findings of this report are preliminary, few policy questions are addressed. However, the report does provide excellent background information on the VEPS approach.

PB82-213208/GAA PC **A05**/MF **A01**
Ahmedabad Textile Industry's Research Association (India).
Chemistry, Chemical Technology and Engineering of Textiles: Proceedings of ATIRA Annual Technological Conference Held on February 3-4, 1964 (Section B).
Feb 64, 89p

Keywords: *Textile industry, Technology, Bleaching, Dyeing, Boilers, Developing country application.

This volume contains papers on short Processing in Bleaching; Effect of Processing Sequence and Stretch on Results of Mercerization; some observations on the Continuous Dyeing With Reactives; Effect of Intermediate Drying on Yield and Wash Fastness of Some Vat, Indigosl and Reactive Dyes; Boiler Feed Water Treatment and Air Conditioning in the Textile Industry.

PB82-213273/GAA PC **A04**/MF **A01**
Hindustan Paper Corp. Ltd., New Delhi (India).
Bleaching Investigations on Bamboo (Dendrocalamus strictus) Pulps.
Research progress rept. no. 21,
R. Pant, N. R. Mohan Rao, R. M. Mathur, and Y. V. Sood. Oct 80, 51p
Sponsored in part by United Nations Development Programme, New Delhi (India).

Keywords: *Bamboo, *Pulp, Calcium hypochlorites, Chlorine oxides, Hydrogen peroxide, Viscosity, Tear strength, Chlorine dioxide, Fibre strength index.

Bleaching studies were carried out on bamboo (Dendrocalamus Strictus) pulp using different bleaching chemicals, viz., calcium hypochlorite, chlorine dioxide, and hydrogen peroxide in different sequences with a view to retain the tear strength of the unbleached pulp to the maximum extent. Studies have shown that the H/C (40:60) EHH sequence improves the viscosity, fibre strength index, and the tear strength of the bleached pulp over the conventional CEHH bleached pulp. The D/C (20:80) EDH sequence retains the maximum tear strength of unbleached pulp.

PB82-213323/GAA PC **A04**/MF **A01**
Hindustan Paper Corp. Ltd., New Delhi (India).
Evaluation of Indigenous and Imported Unbleached and Bleached Chemical Pulps.
Research progress rept. no. 16,
K. S. Moorthy, S. Bharati, Y. V. Sood, and T. K. Roy. 1981, 52p
Sponsored in part by United Nations Development Programme, New Delhi (India).

Keywords: *Chemical industry, Bleaching, Tables(Data), Graphs(Charts), Developing country application.

Laboratory methods for evaluating indigenous and imported unbleached and bleached mill pulps are outlined. They involve beating and testing the relationship between various pulps. Handsheet properties of the pulps was also established. It is expected that the data collected will be of great use to the paper industry.

PB82-213364/GAA PC **A07**/MF **A01**
Council of Scientific and Industrial Research, New Delhi (India).
PINUS,
P. Maheshwari, and R. N. Konar. c1971, 141p
BOTANICAL MONO-7

Keywords: *Pine trees, *Plants(Botany), *India, Morphology, Distribution(Property), Plant anatomy, Embryology, Pollen, Seeds, Production, Breeding, Plant diseases, Cytology, Parasites, Pest control, Economic factors, Developing country application, Himalayan pines.

This comprehensive study of the genus Pinus was undertaken to present a definitive work on the genus. The monograph covers distribution, morphology, anatomy, embryology, germination, cytology, seed testing, seed production and dormancy, breeding, diseases, mycorrhiza, angiospermic parasites, pests, economic uses, pinus species, their native countries and common names, and literature cited.

PB82-213398/GAA PC **A04**/MF **A01**
Council of Scientific and Industrial Research, New Delhi (India). Publications and Information Directorate.
ABIES and PICEA: Morphological Studies,
K. A. Chowdhury. c1974, 55p BOTANICAL MONO-9
Prepared in cooperation with Aligarh Muslim Univ. (India). Dept. of Botany.

Keywords: *Plants(Botany), *India, Morphology, Plant anatomy, Leaves(Botany), Wood, Embryology, Fertilization, Plant reproduction, Seeds, Plant diseases, Economic factors, Cytology, Height, Softwoods, Developing country application, Picea spinulosa, *Spruce trees.

This comprehensive study of the genera Abies and Picea was undertaken to present a definitive work on the genus. The Monograph covers the description, and distribution, morphology and anatomy, embryology, seed, cytology, diseases, economic uses, and fossil history of both genera. The literature cited is also listed.

PB82-213489/GAA PC **A04**/MF **A01**
National Research Council, Washington, DC.
Ecological Aspects of Development in the Humid Tropics (Les Aspects Ecologiques du Developpement sous les Tropiques Humides) (Aspectos Ecologicos del Desarrollo in las Zonas Tropicales Humedas),
J. Savage, C. Goldman, D. Janos, A. Lugo, and P. Raven. 1982, 61p
Sponsored in part by Agency for International Development, Washington, DC. Text in English, French, and Spanish.

Keywords: *Ecology, *Tropical regions, *Agriculture, Genetics, Forest land, Natural resources, Soils, Surface waters, Management.

This booklet provides, in three languages, the introductory matter, summary, and recommendations from a detailed report prepared by a select committee of the U.S. National Research Council for the National Park Service and the Agency for International Development. To these have been added brief commentaries on seven issues judged by the Committee to be of special significance for development in the humid tropics and treated in full in individual chapters of its report.

PB82-213562/GAA PC **E02**/MF **E02**
London Business School (England). Econometric Forecasting Unit.
Term Structure of Interest Rates in a Small Open Economy,
M. Beenstock, and A. Longbottom. Feb 80, 24p
DISCUSSION PAPER-71

Keywords: *Financial management, Capital, *Economic analysis, Investments, Assets.

There is an extensive body of theory and evidence e.g. Hodjera and Beenstock, which suggests that domestic capital markets are closely related to their external counterparts. If this is so, the domestic term structure of interest rates cannot be independent of the external or world term structure of interest rates. In section II the 'international theory' is described and is juxtaposed with respect to the traditional approaches. In section III the 'international theory' is tested using the UK as an example of a small open economy.

PB82-213877/GAA PC **E02**/MF **E02**
London Business School (England). Econometric Forecasting Unit.
Dynamic Aggregate Time Series Relationship between Energy Consumption and Economic Activity in Industrialized Countries,
M. Beenstock, and P. Willcocks. Nov 80, 22p
DISCUSSION PAPER-80

Keywords: *Economic development, *Time series analysis, *Energy, Prices, Economic models, Income, Economic elasticity.

The study measures the aggregate relationship between energy consumption and the level of economic activity in the industrialized countries as a whole. An economic model is presented which distinguishes short/long term price and income elasticities in a systematic fashion.

PB82-213950/GAA PC **A03**/MF **A01**
Ahmedabad Textile Industry's Research Association (India). Chemistry and Chemical Technology Div.
Problems in Chemical Processing of Textiles - Case Histories.
Apr 67, 27p CCT-22

Keywords: *Textile industry, *Chemical industry, Developing country application.

This publication contains 10 case histories on successful solutions to problems affecting the quality of manufactured textiles. Each case study defines the problem encountered, describes the investigation of the problem including the methods used to test the cloth, and recommends the action or actions required to solve the problem. The case studies were prepared on the following problems: (1) White streaks on cloth dyed with azoic combinations; (2) White Stains in color woven coating; (3) White stains in dyed fabrics; (4) Improvement of lustre of doubled yarns by mercerization; (5) Development of aniline black on a resist printed fabric; (6) Stains in blue dyed poplin; (7) Uneven dyeing of beams on package dying machine, (8) Patchy dyeing in poplin sorts; (9) Excessive use of optical brightening agent; (10) Defects in fabric printed with pigment colors.

PB82-215567/GAA PC **A04**/MF **A01**
Industrial Toxicology Research Centre, Lucknow (India).
Toxicology Data Sheets on Chemicals: Malathion,
R. R. Khan, and Bhaskar Dev. Jun 81, 68p DATA SHEET SER-4

Keywords: *Pesticides, Exposure, Dosage, Public health.

Malathion is a non-systemic organophosphorus insecticide of low mammalian toxicity since it is detoxified by B-esterase in the liver. It is extensively used in India and all over the world for the control of a wide spectrum of insects and mites of agricultural, horticultural, veterinary, public health and house-hold importance. Its outstanding toxicity to grain and flour beetles makes malathion a very promising insecticide for use in food grain stores. It does not cause carcinogenic, mutagenic, teratogenic or delayed neurotoxic effects in man or experimental animals. Due to its low toxicity and moderate persistence it continues to be one of the safer pesticides known to man. A tolerance limit of 3 ppm is prescribed in India for its residues on vegetable crops.

PB82-215575/GAA PC **A04**/MF **A01**
Industrial Toxicology Research Centre, Lucknow (India).
Toxic Metals in Environment: A Status Report of R and D Work Done in India,
Satya V. Chandra. Jun 80, 75p

Keywords: *Metals, *Environmental surveys, Public health, *Toxic substances.

This report gives an overview of the problem of environmental pollution by metals in the Indian context and outlines the research work done in India on metal toxicity. The emphasis, in this report, has been necessarily on health hazards to man although a few observations made in India on aquatic organisms have been reviewed. This report is useful not only to Scientists engaged in studies on metal intoxication but also to managers of industrial establishments and government executives entrusted with the metal responsibility of taking decisions on diverse problems posed by environmental pollution by toxic metals.

PB82-215609/GAA PC **A15**/MF **A01**
Indian National Science Academy, New Delhi.
Basic Sciences and Agriculture (Proceedings of the Symposium on Basic Sciences and Agriculture Held at New Delhi during 11-13 October 1975).
Scientific rept. series.
1978, 328p INSA-BULL-55

Keywords: *Plants(Botany), *Agriculture, *India, Embryology, Pollen, Cells(Biology), Reproduction(Biology), Environmental impacts, Photosynthesis, Plants(Biology), Plant diseases, Water consumption, Efficiency, Plant hormones, Remote sensing, Nitrogen fixation, Breeding, Animal husbandry, Plant physiology.

This book is a compendium of papers presented at a symposium held in New Delhi from 11 to 13 October, 1975. The papers are entitled: Genetics and Agriculture; Cytogenetics and Agriculture; Biometrical Genetics; and Agriculture; Genetic Transformation Transduction and Transgenosis and their Potential Role in Agriculture; Impact of Embryology on Agriculture; Pollen-stigma Interaction - Recognition, Acceptance and Rejection; Anther-Culturing and Agriculture - Problems and Prospects; The Culturing of Cells and Protoplasts; Propagation of Plants through Tissue-Culture; Chronobiology - Environmental Factors Regulating Reproduction in Animals; The Environment in Relation to Agriculture; Photosynthetic Efficiency in Relation to Agriculture; Photosynthetic Efficiency in Relation to Agriculture; Chronobiology in Plants; Meteorology and Forecasting of Epidemics of Diseases; The Energetics of Photosynthesis; Stomatal Regulation - A Strategy for Improved Water-use Efficiency and Carbon Economy; Plant Hormones and Sex; Nitrogen Fixation.

PB82-215617/GAA PC **A08**/MF **A01**
Council of Scientific and Industrial Research, New Delhi (India).
Loranthaceae,
B. M. Johri, and S. P. Bhatnagar. c1972, 166p
BOTANICAL MONO-8

Keywords: *Plants(Botany), *India, Taxonomy, Shrubs, Losses, Citrus trees, Plant tissues, Tropical regions, Classifications, Morphology, Anatomy, Distribution(Property), Books, Developing country application, Mangos, *Loranthaceae.

This comprehensive study of the genus Loranthaceae was undertaken to present a definitive work on the genus. The monograph covers systematics, distribution, morphology, anatomy (leaf, stem, root), and a haustorial system.

PB82-215625/GAA PC **A09**/MF **A01**
Indian National Science Academy, New Delhi.
Summer School on Fishery Biology, April 10-14, 1978 Held at Mangalore.
Scientific rept. series,
A. G. K. Menon. Apr 78, 188p

Keywords: *Education, *Fisheries, *India, marine biology, Taxonomy, Animal physiology, Feeding stuffs, Food habits, Aquaculture, Fecundity, Carp, Catfishes, Animal ecology, Developing country application.

The papers included in this report are: Principles of Systematic Icthylogy; Some Points of Interaction between Fishery Biology and Fish Physiology; Stock Assessment and Management; Recent Trends in Systematic Ichthyology; Systematic Revision of the Indian Species of Ilisha Richardson, 1846 (Pisces: Clupeiformes); Evolution and Taxonomy of Catfishes of India; The Satpura Hypothesis; Food and Feeding Habits of Punitus Sarana subnasutus; Relationship of Bucco-pharynx with the Food and Feeding Habits of Labeo dero; Role of Mangrove Forests of Pichavaram as Fish Nurseries; Food Selection and Feeding Habits of Tilapia mossambica Peters in Different Ecological Habitats.

PB82-215666/GAA PC **A03**/MF **A01**
Appropriate Technology Development Organization, Islamabad (Pakistan).
Mini and Micro Hydel Plants.
May 80, 30p

Keywords: *Hydroelectric power, *Construction, Cost analysis, Energy sources, Developing country application.

Mini- and Micro Hydroelectric plants can be an important source of energy in areas of isolated villages away from larger electric power sources. This program attempts to provide such power sources throughout Pakistan. An outstanding feature of the program is the participation of the local community to the optimum extent. The entire civil works, the intake system, power channel forbay penstock and power house building, as well as labor are provided by the inhabitants voluntarily. While maximum use is made of stone and wood which are locally available, almost free, only a small amount of cement needs to be made or purchased. Capital is required to purchase the distribution wires, turbines, and generator, but the cost of the turbine is very low as its design as been developed by the Appropriate Technology Development Organization and is fabricated locally.

PB82-215856/GAA PC **A06**/MF **A01**
Indian Chemical Manufacturers Association, Bombay.
Lecture Series on Recent Advances in Man-Made Fibre Industry Held at Bombay on March 20, 1975.
Mar 75, 111p

Keywords: *Technology transfer, *Textile industry, Technology, Manufacturing, Coloring, Dyeing, Textile finishing, Developing country application.

The various papers presented at the lecture series covered the following topics: Recent advancement in the Technology for manufacture of Cellulosic Fibres, Recent advances in the manufacture of textile synthetic fibres; Recent advances in coloration of man-made fibres; Recent advances in the development of chemical finishes for man-made textiles; Recent advances in non-textile uses of man-made fibres; and Newer man-made fibres.

PB82-215872/GAA PC **A05**/MF **A01**
Central Inst. of Road Transport, Poona (India).
National Seminar on Productivity in State Transport Undertakings, November 26-27, 1976.
Nov 76, 98p

Keywords: *Transportation, *Productivity, Scheduling, Maintenance, Costs, Personnel, Meetings, *India, Developing country application.

Productivity in government-managed public bus transportation is gaining increasing attention. Increased productivity would lead to better service, better fleet maintenance and savings in cost. The important components of productivity viz. Routing and Scheduling, Maintenance, Personnel and Financial Control systems, are discussed in this seminar. A few case studies of state-run systems in India are presented. Some other specific aspects covered are: maintenance of tires, batteries, spare parts, and shock absorbers, energy conservation, industrial engineering, and simulation models on routing and scheduling.

PB82-216425/GAA PC **A05**/MF **A01**
Ahmedabad Textile Industry's Research Association (India).
Personality, Organization and Motivation on the Job.
Research note,
Rupande Sutaria, and V. Padaki. Aug 76, 98p HR-85

Keywords: *Management techniques, *Employee participation, Job satisfaction, Motivation, Incentives, Attitude surveys, Environments, India, Developing country application.

This series of four research notes studies human relations in the textile industry, seeking to improve conditions from a management viewpoint. The conclusions reached were: personality didn't affect job satisfaction; job content was a cause of satisfaction while job surroundings were a cause of dissatisfaction; creating an awareness in weavers of how to improve their techniques and incentives to better motivation improved performance, employee turnover is reduced if the employee knows his duties clearly and is aware of the possibility of advancement.

PB82-216433/GAA PC **A04**/MF **A01**
Ahmedabad Textile Industry's Research Association (India).
Use of Tamarind Kernel Powder as a Cotton Warp Size: A Review,
P. C. Mehta, P. N. Bhatt, S. S. Trivedi, and C. C. Shah. 1981, 57p

Keywords: *Textile industry, Starches, Standards, Tests, Developing country application.

Tamarind kernel powder has been used for many years for sizing in the cotton textile industry. However, widely divergent views are found regarding its suitability for this purpose. This research note gives the results of an extensive investigation to evaluate tamarind kernel powder as a sizing material compared with the commonly used starches. The experiments cover warp counts from 18s to 60s and read/pick up to 112/56. This study has shown that tamarind kernel powder of a definite standard compares very well with starches, even for heavy sorts, e.g., 112 reed or for super fine cloth. The research note also gives I.S.I. Standards and methods of tests for Tamarind Kernel powder as well as a brief review of its physical and chemical properties and a comparison of different desizing methods when T.K.P. is used for sizing. A review at the end of the book covers abrasion resistance and weavability, color, cost, excessive frothing, accumulation of foreign matter on the fents, sticking of fibers on the drying cylinders, desizing and uneven dying, increased load on the drying cylinders, and the effect of humidity.

PB82-216532/GAA PC **A02**/MF **A01**
Indian Paint Association, Calcutta.
Role of Paint in Protection Against Corrosion.
1977, 21p

Keywords: *Paints, *Corrosion, Developing country application.

Corrosion of metals, specially of steel, is a gigantic problem. The losses due to corrosion can be reduced dramatically. This brochure explains the role paints can play in combating this problem. The report provides a chart giving the characteristics of different types of paint and explains the proper method of cleaning the surface and applying the paint to stop and prevent corrosion.

PB82-217811/GAA PC **A06**/MF **A01**
Pennsylvania Univ., Philadelphia.
Market Structure, International Technology Transfer, and the Effects on Productivity of the Composition of R and D Expenditures: Final Report,
Edwin Mansfield. 1981, 106p* NSF/PRA-81031
Grant NSF-PRA77-08178
See also PB82-217829.

Keywords: *Technology transfer, *Productivity, *Marketing, Expenses, Cost analysis, Economic impact, Questionnaires, *Research and development, Industrial structure.

Findings based on three aspects of research are presented: (1) the effects on productivity change of the composition of industrial R&D expenditures and the change over time in the composition of industrial R&D expenditures; (2) technology transfer to overseas subsidiaries by UnitedStates-based firms; and (3) technology change and market structure--focusing on imitation costs, patents, and industrial concentration. The project's objectives are presented as originally proposed and as modified during the study. Changes included a large increase in both the number of firms from which data concerning the composition of R&D was obtained, and the number of case studies used in the second part of the study. A summary of results include a listing of papers and a book based wholly or in part on the research. Some of the questionnaires used to obtain information are provided in the appendices.

PB82-217969/GAA PC **A03**/MF **A01**
Southwest Research Inst., San Antonio, TX.

Development of Low Cost Pavement Marking Materials Based on Plasticized Sulfur.
Final rept. Jun 78-Mar 82,
John M. Dale. Apr 82, 34p SwRI-05-5342, FHWA/RD-82-060
Contract DOT-FH-11-9450

Keywords: *Pavements, Binders(Materials), Sulfur, Organic pigments, Materials specifications, Field tests, Texas, Colorado.

This research project was undertaken to develop a practical pavement marking material at a significantly lower unit cost based on plasticized sulfur with performance equal to or better than rapid-dry traffic paint. A yellow formulation was developed and taken through pilot tests and large scale field tests in Texas and Colorado.

PB82-218033/GAA PC **A03**/MF **A01**
Arizona Dept. of Transportation, Phoenix.
Arizona's Pavement Management System. Phase II: Analysis of Testing Frequency for Pavement Evaluation.
Final rept.,
George B. Way, John F. Eisenberg, and James P. Delton. Sep 81, 39p FHWA/AZ-81/169-1

Keywords: *Pavements, Deflection, Surface roughness, Cracking(Fracturing), Data acquisition, Standard deviation, Arizona.

A Pavement Management System (PMS) is highly dependent on the quantity and quality of data. This report addresses the frequency of inventory tests (deflection, rutting, cracking, flushing) necessary to insure appropriately sufficient quality of data. A designed experiment consisting of the above field tests were conducted at 76 two-mile locations, where 10 tests per mile (at .1 of a mile) were conducted.

PB82-218447/GAA PC **A05**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Div. of Surveillance, Hazard Evaluations and Field Studies.
Potential Health Hazards of Video Display Terminals.
Jun 81, 84p DHHS/PUB/NIOSH-81-129

Keywords: *Environmental surveys, *Health, *Safety, Data displays, Exposure, Human factors engineering, Man machine systems, Sampling, Interviews.

Hazards associated with work at visual display terminals (VDTs) were surveyed. Radiation measurements, environmental sampling, employee interviews, and ergonomic assessments were performed at three companies in San Francisco, California, where VDTs were used. Measurements of X-ray, radiofrequency, ultraviolet, and visible radiation exposures were either undetectable or well below current exposure standards. No chemical exposures were identified from environmental sampling. Ergonomic evaluations revealed problems due to glare and height of the keyboards and display screens. VDT operators frequently reported visual discomfort, muscular problems, and stress of anxiety. Recommendations are included for radiation monitoring, workstation design modifications, illumination, glare control, work rest schedules, and visual testing.

PB82-218470/GAA PC **A03**/MF **A01**
National Bureau of Economic Research, Inc., New York.
Patents, R and D, and the Private Value of Knowledge: Explorations in the Economics of Technological Change.
Final rept,
Zvi Griliches, and M. Ishaq Nadiri. Feb 82, 37p NSF/PRA-82009
Grant NSF-PRA79-13740

Keywords: *Economic analysis, Expenses, *Productivity, Research projects, Market value, Social perception, *Research and development.

The report describes a study to (1) explore the potential contribution of newly available patent data in order to understand the processes of technological change; (2) relate the quality of aggregate total factor productivity data (collected by a survey) to estimate the contribution of research and development (R&D) to the aggregate industry or economy-wide levels; and (3) stimulate interaction among researchers, using the National Bureau of Economic Research (NBER) resources, via seminars, workshops, and a special conference. A 'path analysis' diagram is used to describe the conceptual framework guiding the research. Discussed are patents and R&D at the firm level; market value of R&D and patents; R&D and productivity at both the firm and industry levels; the collection and construction of data bases; and interaction, dissemination, and training.

PB82-218785/GAA PC **A04**/MF **A01**
Central Rice Research Inst., Cuttack (India).
Assessment of Germplasm for Resistance Against Major Cereal Diseases-Rice,
S. Y. Padmanabhan. Jun 77, 73p
Sponsored in part by Indian Council of Agricultural Research, New Delhi.

Keywords: *Rice, *Plant diseases, *India, Protection, Insecticides, Losses, Pest control, Germ cells, Field tests, *Plants(Botany), Developing country application, Germplasm.

Plant protection research has made rapid strides; however it is increasingly felt that complete reliance on chemical protection alone may not be in the best interests of the crop in relation to its natural environment. Genetic resistance continues to play an important role in the containment of losses caused by pests and diseases. This report compiles all available information on the reaction of rice germplasm collections to major diseases.

PB82-219130/GAA PC **A11**/MF **A01**
Middlesex County Planning Board, New Brunswick, NJ.
Prototype Planning Study: Middlesex County, New Jersey.
Final rept.
1979, 250p DOT-I-82-7

Keywords: *Transportation management, Counties, *Roads, Noise reduction, Vehicular traffic control, New Jersey, Transportation planning, Traffic congestion, Middlesex County(New Jersey), Energy consumption, Pollution control, Traffic management, Peak hour traffic, Transportation corridors.

Middlesex County, New Jersey is experiencing transportation problems. To help solve escalating traffic problems on the county roads, they explored the potential of transportation systems management (TSM) techniques. The strategies they investigated fell into three groups: supply oriented, transportation demand oriented, and transit oriented. The study found that the supply oriented strategies, which are aimed at improving highway efficiency, appear most effective at reducing noise and air pollution, energy consumption, user travel costs and traffic accidents. The demand management strategies showed potential for reducing noise and air pollution, energy consumption, and peak period congestion, especially in the vicinity of major employment centers. The transit strategies focused on improved transit service and marketing in problem corridors, with industrial areas, commercial sites, and institutional centers identified as places with high payoff. The document also describes citizen involvement and organizational issues associated with the project, including the formulation of implementation and monitoring guidelines.

PB82-219973/GAA PC **A08**/MF **A01**
Great Plains Agricultural Council.
Proceedings of Transportation Modeling Workshop Held at Fort Collins, Colorado on January 8-9, 1981.
Great Plains agricultural council publication,
John W. Green. Nov 81, 158p GPAC-100
See also PB82-219981 through PB82-220054. Prepared in cooperation with Colorado State Univ., Fort Collins. Dept. of Economics.

Keywords: *Transportation management, Interstate transportation, Highway transportation, Rail transportation, Waterway transportation, Management planning, Network flows, Linear programming, Computer graphics, Technology assessment, Coal handling, Agricultural products.

The Social and Economic Implications of Energy Extraction, Conversion, and Transportation Committee (GPC-8) of the Great Plains Agricultural Council organized and cosponsored, with the Old West Regional Commission, a workshop on transportation models in Fort Collins, Colorado in January, 1981. There were nine presentations describing large scale government sponsored models, private industry transportation planning procedures, transportation system management and regulation, and projected needs for additional transportation capacity. Approximately 30 people attended the workshop. Each presentor spent an hour speaking and answering questions. Each presentor's formal paper is included along with questions and answers relevant to his or her presentation.

PB82-220153/GAA PC **A09**/MF **A01**
Ohio State Univ., Columbus. Dept. of Civil Engineering.
Optimization of Design of Asphaltic Paving Mixtures.
Final rept.,
Kamran Majidzadeh, Ahmed El-Laithy, Mohamed Rashad El-Mitiny, M. A. El-Mojarrush, and Nabil Safwat. Feb 80, 192p EES-560, FHWA/OH-81/005
Sponsored in part by Ohio Dept. of Transportation, Columbus.

Keywords: *Pavements, Asphalts, Aggregates, Subgrades, Compacting, Fatigue(Materials), Field tests, Ohio, Optimization.

This study concerned the optimization of asphaltic paving mixtures, through evaluation of: Marshall mix design characteristics considering the effects of aggregate type and gradation and compaction method; mixture optimization with respect to rutting characteristics; and optimization with respect to fatigue criteria. Surface course mixes were prepared with three aggregates (limestone-limestone sand, gravel-natural sand, and slag-slag sand) at three gradations (dense-graded, gap-graded and open-graded) and Marshall samples were prepared using kneading, gyratory and 50-blow drop hammer compaction. Effect of aggregate type and gradation on rutting and fatigue were also evaluated.

PB82-220500/GAA PC **A06**/MF **A01**
Ahmedabad Textile Industry's Research Association (India).
Various Techniques Used in Textile Manufacture.
Jun 71, 102p

Keywords: *Textile industry, *Chemical industry, Manufacturing, Developing country application.

This book is composed of several technical reports and leaflets outlining different techniques used in various aspects of textile production. The report titles are: Cleaning achieved and lint lost in blow room and carding; twist flow in the spinning zone yarn; sizing of polyester blend yarns; substitutes for mutton tallow in sizing; staggering of healds on looms - a means for reducing end breaks; short process in bleaching; studies on vat dyeing; partial replacement of hydrosulphite in vat dyeing by other reducing agents; reduction of consumption of hydrosulphite in dyeing; effect of thickener composition on color yield in vat color printing; survey of resin finished fabrics.

PB82-220526/GAA PC **A04**/MF **A01**
Concentration Specialists, Inc., Andover, MA.
Design, Fabrication and Start-Up of a 25,000 GPD Absorption Freezing Vapor Compression Desalination Pilot Plant.
Final rept.
May 81, 70p W82-04724
Contract DI-14-34-0001-8502

Keywords: *Desalination, Pilot plants, Performance evaluation, Design criteria, Revisions, Equipment.

Concentration Specialists, Inc. designed, built, initiated start-up and began operational testing of a 25,000 gallons per day absorption freezing vapor compression (AFVC) sea water desalination plant at the Office of Water Research and Technology's Test Facility at Wrightsville Beach, North Carolina. The AFVC process is a novel freezing process based upon an absorption cycle powered by a heat pump. The energy savings and lack of corrosion of freezing compared to evaporative processes is a significant feature of this process. The pilot plant was designed to produce 25,000 gallons per day of fresh water while consuming 49 kWh of energy per 1000 gallons of product water. Upon design and fabrication, start-up and operational testing of the pilot plant has shown the need for considerable process and component modification as would be expected with a developmental process. By the end of the contract period, June 1980, the pilot plant produced 8000 gallons per day of product water under non-steady state operating conditions. Equipment modification continues toward increasing plant capacity and achieving steady state production.

PB82-220674/GAA PC **A07**/MF **A01**
Illinois Univ. at Urbana-Champaign. Water Resources Center.
Influence of Chlorination and the Distribution System of Mutagens in a Potable Water Supply.
Final rept.,
Robert Raymond Clark, and James B. Johnston. Mar 82, 149p UILU-WRC-82-0168, W82-04961, , OWRT-B-125-ILL(1)
Contract DI-14-01-0001-9148

Keywords: *Water treatment, *Potable water, Adsorption.

A growing number of studies have detected mutagens in public water supplies. This study examined a central Illinois public water supply and found the presence of mutagens dependent on mammalian metabolism (promutagens) in addition to chlorination-related, direct-acting mutagens. Both kinds of mutagens were recovered by adsorption on polyurethane foam and quantitated by the Ames Salmonella/microsome reversion assay. Particulate matter collected from hydrant flush water at dead ends in the distribution system were found to harbor high amounts of two known carcinogens and other unidentified mutagenic substances. These high levels of mutagens were not found in tap water, nor could the carcinogens be identified in the tap water.

PB82-222308/GAA PC **A99**/MF **E02**
American Water Works Association Research Foundation, Denver, CO.
Proceedings of the Water Reuse Symposium II Held at Washington, DC. on August 23-28, 1981. Volume 3.
1981, 936p NSF/CEE-81100
Grant NSF-ISP81-08152
See also PB82-222316 through PB82-222811 and PB82-223637. Sponsored in part by Office of Water Research and Technology, Washington, DC., Department of the Army, Washington, DC. and Environmental Protection Agency, Washington, DC.

Keywords: *Waste water reuse, *Industrial wastes, *Agriculture, Economic factors, Public health, Quality, Legislation, Energy, Monitoring, Mathematical models, Project planning, Marketing, Law(Jurisprudence), Constraints, Water conservation, Energy development.

The Symposium was devoted to the renovation and reuse of wastewaters from municipal, industrial, and agricultural sources. The proceedings are divided into eleven chapters addressing key concerns that must be satisfied prior to successful implementation of water reuse. Economics, regulatory and legal constraints, health effects, water quality needs, planning, and engineering, among other factors, are covered for wastewater sources and water users. Volume 3 focuses on health and quality considerations, legal issues, reuse in the energy industry, monitoring and modeling, and planning and marketing for reuse.

PB82-222977/GAA
(Order as PB82-222944/GAA, PC **A03**/MF **A01**)
Oregon State Univ., Corvallis. Agricultural Experiment Station.
Microbiological Profile of Pacific Shrimp, 'Pandalus jordani', Stowed Under Refrigerated Seawater Spray,
J. S. Lee, and Edward Kolbe. Mar 82, 6p
TECHNICAL PAPER-5757
Included in Marine Fisheries Review, v44 n3 p12-17 Mar 82.

Keywords: *Microbiology, *Food storage, Sea water, Growth, Food deterioration, Pacific shrimp.

Microbial counts of refrigerated seawater, which held shrimp at -1.1C (30F) for 3 days, varied depending on the systems examined. Although Flavobacterium-Cytophaga sp. predominated the microbial flora of initial seawater (46%), the microbial population in subsequently refrigerated seawater was dominated by Moraxella sp. (96%) in one instance and Pseudomonas sp (88%) in another. Moraxella sp. were the most difficult to eliminate on the fishing vessels, and poorly washed shrimp tended to yield more Arthrobacter sp. Most microorganisms grew poorly washed shrimp tended to yield more Arthrobacter sp. Most microorganisms grew poorly in chilled seawater.

PB82-223082/GAA PC **A99**/MF **A01**
American Water Works Association Research Foundation, Denver, CO.
Proceedings of the Water Reuse Symposium II Held at Washington, DC. on August 23-28, 1981. Volume 1.
1981, 819p NSF/CEE-81098
Grant NSF-ISP81-08152
See also PB82-223090 through PB82-223629 and PB82-223637. Sponsored in part by Office of Water Research and Technology, Washington, DC., Department of the Army, Washington, DC. and Environmental Protection Agency, Washington, DC.

Keywords: *Waste water reuse, *Industrial wastes, *Agriculture, Economic factors, Regulations, Constraints, Legislation, Public health, Water pollution, Civil engineering, Water conservation, Financing, Water reclamation, Water supply, Global, Recycling.

The symposium was devoted to the renovation and reuse of wastewaters from municipal, industrial, and agricultural sources. The proceedings are divided into eleven chapters addressing key concerns that must be satisfied prior to successful implementation of water reuse. Economics, regulatory and legal constraints, health effects, water quality needs, planning, and engineering, among other factors, are covered for wastewater sources and water users. The proceedings demonstrate that significant global interest exists in wastewater reuse, that recycling concepts are being applied to a broad range of functions, that application of water reuse may be highly situation-dependent, and that reuse applications are important solutions for the conservation of water. Volume 1 focuses on: (1) needs and funding alternatives for water reuse in the future; (2) municipal wastewater reclimation and reuse and water supply augmentation; (3) water reuse around the world; and (4) industrial recycling and reuse.

PB82-223637/GAA PC **A99**/MF **E02**
American Water Works Association Research Foundation, Denver, CO.
Proceedings of the Water Reuse Symposium II Held at Washington, DC. on August 23-28, 1981. Volume 2.
1981, 894p NSF/CEE-81099
Grant NSF-ISP81-08152
See also PB82-223645 through PB82-223793, PB82-221912 through PB82-222290, PB82-223082 and PB82-222308. Sponsored in part by Office of Water Research and Technology, Washington, DC., Department of the Army, Washington, DC. and Environmental Protection Agency, Washington, DC.

Keywords: *Waste water reuse, *Industrial wastes, *Agriculture, Water reclamation, Food industry, Research projects, Water conservation, Operations, Sewage treatment, Farms, Marketing, Monitoring, Public health, Water supply, Financing, Project planning, Potable water.

The symposium was devoted to the renovation and reuse of wastewaters from municipal, industrial, and agricultural sources. The proceedings are divided into eleven chapters addressing key concerns that must be satisfied prior to successful implementation of water reuse. Economics, regulatory and legal constraints, health effects, water quality needs, planning, and engineering, among other factors, are covered for wastewater sources and water users. Volume 2 focuses on agricultural reuse, food industry recycling, and R and D treatment operations.

PB82-223967/GAA PC **A11**/MF **A01**
Boyle Engineering Corp., Newport Beach, CA.
Evaluation of Agriculture Irrigation Projects Using Reclaimed Water.
Evaluation rept.
Mar 81, 248p SWRCB-2

Keywords: *Waste water reuse, *Irrigation, Subsurface irrigation, Sprinkler irrigation, Water pollution, Soil properties, Drainage, Cultivation, Subsurface drainage, Chemical properties, Poisons, Saline soils, Permeability, Toxicity, Leaching, Water reclamation, California.

The purpose of this report is to identify the benefits and limitations of using reclaimed municipal wastewater for agricultural irrigation in California and to establish a data base for planning future wastewater reclamation projects. This report is based on a review of 21 wastewater reclamation projects where reclaimed water is used for agricultural irrigation.

PB82-223991/GAA PC **A06**/MF **A01**
Wisconsin Univ.-Milwaukee. Center for Urban Transportation Studies.
Examination of Methods for Coordination of Transportation Planning Activities.
Final rept. Oct 81-Apr 82,
R. Schmitt, J. Weitman, and E. Beimborn. Apr 82, 105p UMTA-WI-11-0007-82-1
Grant DOT-UMTA-WI-11-0007

Keywords: *Transportation management, *Urban planning, Coordination, States(United States), Decision making, Local government, Transportation planning.

The purpose of this study was to examine alternative means by which Metropolitan Planning Organizations (MPOs) coordinate transportation planning activities in different areas of the country. The study involved an inventory of the MPOs representing the 100 largest metropolitan areas in the U.S. The inventory provided a cross-sectional view of transportation planning in these areas. In this study MPOs were found to generally perform effectively as a forum for decision-making. Relationships with transit agencies and units of local government were typically good, especially where the MPO has adopted a service-oriented philosophy towards these agencies. Relationships between MPOs and states are more complex with different degrees of local autonomy.

PB82-225533/GAA PC **A08**/MF **A01**
Council of Scientific and Industrial Research, New Delhi (India).
Research and Development Management: Concepts and Techniques,
1974, 173p
Prepared in cooperation with Administrative Staff College India, Hyberabad.

Keywords: *Management techniques, *Research and development, Personnel management, Organizations, Resources, India, Developing country application.

The volume contains the views of the management experts as they try to apply the principles of the management sciences to the problems of research institutions in India. This book is divided into four chapters. The first chapter is a collection of papers and discussions that concern general topics, such as the social role of science, and the management process for R & D organizations. Chapters 2, 3, and 4 are concerned with the management areas of organization structure and dynamics, R & D project management, and management of human resources.

PB82-225657/GAA PC **A10**/MF **A01**
Koba Associates, Inc., Washington, DC.
Chemical Information Resources Handbook.
Toxics Integration Information series (Final).
Brian Karnovsky, John King, Pam Thielmann, Kevin Gleason, and Mitch Baer. Jan 80, 208p EPA-560/TIIS-81-001
Contract EPA-68-01-5961

Keywords: *Information systems, Toxicology, Regulations, *Toxic substances.

This handbook describes several of the more important chemical information resources available and accessible through government and private organizations. The handbook provides a framework for searching and retrieving information on chemical toxicology, environmental effects, spill responses, disposal methods, ambient air and water concentrations, control technologies, and existing regulations. This is a part of the Toxics Integration and Information series.

PB82-225871/GAA PC **A05**/MF **A01**
Pennsylvania Univ., Philadelphia. Dept. of Civil and Urban Engineering.
Train Crew Reduction for Increased Productivity of Rail Transit.
Final rept.,
V. R. Vuchic, R. Clarke, M. C. Fenton, IV, M. Lu, and T. J. Potter, Jr. Feb 82, 92p UMTA-PA-11-0023-82-2
Contract DOT-UMTA-PA-11-0023
See also PB82-225863.

Keywords: *Management planning, *Rail transportation, Urban areas, *Productivity, Manpower, Reduction, Cost engineering.

Since operating personnel in transit usually represent a substantial, sometimes dominant portion of its labor force, productivity of operating personnel is the major determinant of overall labor productivity in transit agencies. This study focuses on labor productivity in operations of rail transit systems. The focus is on rail systems since rail modes have a considerable potential to achieve an extremely high level of labor productivity through utilization of modern operating practices which have not yet been introduced in many cities.

PB82-226119/GAA PC **A09**/MF **A01**
Gellman Research Associates, Inc., Jenkintown, PA.
Relationship Between Industrial Concentration, Firm Size, and Technological Innovation.
Final rept.,
Stephen Feinman. Jun 82, 195p
Contract SBA-2652-0A-79

Keywords: *Industrial plants, Industries, Capital, Economic analysis, Organization structure, *Small businesses.

The study tests the following hypotheses: (1) the frequency of innovation is inversely proportional to industry concentration; (2) the time required for the innovation process to be completed is not a function of industry concentration; (3) old capital intensive industry sectors are less intensive than new, capital intensive industry sectors; (4) the time required for completion of the innovation process is the same in small firms as in large and medium-size firms; and (5) small firms in diffuse industries are more innovative than small firms in concentrated industries.

PB82-226929/GAA PC **A02**/MF **A01**
Cambridge Univ. (England). Dept. of Engineering.
Centrifugal Testing of Microconcrete Retaining Walls Subjected to Base Shaking,
M. D. Bolton, and R. S. Steedman. 1982, 23p
CUED/D-SOILS/TR-120-1982
Also pub. as ISSN-0309-7539.

Keywords: *Earthquakes, Model tests, Vibration, Reinforced concrete, Backfills, Lateral pressure, *Earthquake engineering.

The essence of centrifugal model testing lies in the use of materials similar to those employed in the field, formed in similar geometries with every dimension in the model reduced by the scaling factor n, and the model subjected to centripetal accelerations n times earth's gravity. Boundary conditions should be replicated as closely as possible in terms of stress or scaled displacement. The specific objective of the tests reported was to observe and classify the behavior of reinforced concrete cantilever walls with granular backfill, subjected to simplified earthquakes of various intensities.

PB82-227430/GAA PC **E10**/MF **E10**
Dundee Univ. (Scotland).
Approaches to the Teaching of Essentials of Anatomy in Developing Countries.
Master's thesis,
Indra Bhargava. May 79, 230p

Keywords: *Education, Instructional materials, Developing countries, Iran, Instructors, Methodology, Developing country application.

Medical education in developing countries is faced with an acute shortage of men, material, money and management. While teaching anatomy in Iran, the author was faced with a complex situation with abundant money and a formidable language barrier on account of poor knowledge of English on part of the students. In response to these local problems, he evolved a diagrammatic approach involving a purposive and discriminatory coloring of predrawn diagrams, depicting essential anatomical characteristics of the region. These diagrams were compiled in form of a workbook. It was hypothesized that this approach will result in better learning through motivation, render instruction more conveniently and easily managed andimprove the attitudes towards anatomy. The effectiveness was evaluated by comparing the responses to a questionnaire and examination scores of ttudents taught with and without the aid of a workbook.

PB82-228693/GAA PC **A05**/MF **A01**
Interagency Task Force on Small Business Finance, Washington, DC.
Studies of Small Busines Finance: Small Firms' Access to Public Equity Financing,
Hans R. Stoll. Feb 82, 82p* ITFOSBF-82/02
See also PB82-228685, and PB82-228701.
Also available in set of 23 reports PC E99, PB82-228677.

Keywords: *Financial management, Capital, Investments, Cost analysis, *Small businesses.

The study discusses the factors that affect small business' use of public financing, in terms of the costs to the small business and to investors. It suggests that in both the primary and secondary equity markets the costs of financing are more than most small firms can manage. The principal costs include: underwriting fees for new equity issues as well as spreads and commissions on traded securities. These changes are typically higher for small business because of the small financing amount, infrequently traded securities, and lack of investor information about the firm.

PB82-228735/GAA PC **A04**/MF **A01**
Interagency Task Force on Small Business Finance, Washington, DC.
Studies of Small Business Finance: Tax Policy and Small Business Financing,
Thomas S. McCaleb. Feb 82, 62p* ITFOSBF-82/06
See also PB82-228727, and PB82-228743.
Also available in set of 23 reports PC E99, PB82-228677.

Keywords: *Taxes, Risk, Economic impact, Corporations, Incentives, Fiscal policies, *Small businesses, Loans.

The report discusses the effects of taxation on investment risk-taking and on sources of small business financing. For providing risk-taking incentives, the author states that a progressive tax is less favorable to risk-taking than a proportional tax. Also, the inclusion of some form of loss offset is favorable to risk-taking. Small businesses, however, may not be able to take advantage of an offset provision because they may not have the current, past, or future income to fully utilize the offset. Therefore, a loss is relatively more significant to a small business, raising the risk of investing in it. Taxation also affects sources of financing. Because interest on debt is tax deductible and dividends are not, firms are encouraged to finance with debt.

PB82-228743/GAA PC **A04**/MF **A01**
Interagency Task Force on Small Business Finance, Washington, DC.
Studies of Small Business Finance: The Impact of Usury Laws on the Effectiveness and Efficiency of the Operation of Small Business,
R. Richardson Pettit, and John J. McConnell. Feb 82, 75p* ITFOSBF-82/07
See also PB82-228735, and PB82-228750.
Also available in set of 23 reports PC E99, PB82-228677.

Keywords: *Financial management, Financing, Legislation, Competition, Credit, Management analysis, *Small businesses, Loans.

The study takes an extensive look at the effect of interest rate ceilings on the behavior of lenders and thus the effect on small business borrowers. The study gives both empirical and theoretical arguments for the actual effects of rate ceilings on lenders and borrowers. It is shown that as rate ceilings become more restrictive high risk borrowers, both consumers and business, are eliminated from the market. Also as the restrictions become more severe, lenders shift capital to less restrictive markets, and the structure of loans change to shorter maturities and smaller loan sizes.

PB82-228776/GAA PC **A04**/MF **A01**
Oregon State Personnel Div., Salem.
Studies of Small Business Finance: Role of Small Business in the American Economy,
Lawrence J. White. Feb 82, 73p* ITFOSBF-82/10
See also PB82-228768, and PB82-228784.
Also available in set of 23 reports PC E99, PB82-228677.

Keywords: *Economic development, Regression analysis, Employment, Sales, Economic analysis, *Small businesses.

The study provides a two-part explanation of small business's role in the economy. The first part takes a current and historical look at the relative importance of small business in various sectors of the economy. In the second part, a quantitative approach is used to explain why small businesses fare better in some sectors of the economy and not in other sectors. The study uses extensive sales and employment data as well as regresssion analysis to support the findings.

PB82-228784/GAA PC **A03**/MF **A01**
Oregon State Personnel Div., Salem.
Studies of Small Business Finance: Who Finances Small Business Circa 1980,
Victor L. Andrews, and Peter C. Eisemann. Feb 82, 35p* ITFOSBF-82-11
See also PB82-228776, and PB82-228792.
Also available in set of 23 reports PC E99, PB82-228677.

Keywords: *Financial management, *Banking, Finance, Banks(Buildings), Credit, *Small businesses, Loans.

The study explains the different sources of financing available to a small business and how each source affects the small business community. The sources covered include: Trade Debt, Commercial Banks, Insurance Companies, Finance Companies, and Government.

PB82-228834/GAA PC **A03**/MF **A01**
Interagency Task Force on Small Business Finance, Washington, DC.
Studies of Small Business Finance: Credit Rationing and Small Business Finance,
Stuart I. Greenbaum, George Kanatas, and Sudhakar D. Deshmukh. Feb 82, 49p* ITFOSBF-82/16
See also PB82-228826, and PB82-228842.
Also available in set of 23 reports PC E99, PB82-228677.

Keywords: *Financial managment, *Banking, Banking business, Economic models, *Small businesses, Interest rate, Loans, Brokerage industry, Financial services.

In their study, the authors explain credit rationing and how it affects small businesses' chances of financing through loans. With the help of a mathematical model the decision processes of two lender types are discussed. The first type of lender, an asset-transformer, acquires funds in anticipation of loan demand, at a fixed-rate and is relatively less sensitive to an applicant's qualifications. The second lender type is a broker, who acquires lendable funds as needed and, assuming constantly increasing interest rates, has relatively greater costs. A broker will also be more critical of applicant risk than the asset-transformer.

PB82-228842/GAA PC **A03**/MF **A01**
Interagency Task Force on Small Business Finance, Washington, DC.
Studies of Small Business Finance: Credit Cards and the Financing of Small Businesses,
Lewis Mandell. Feb 82, 29p* ITFOSBF-82/17
See also PB82-228834, and PB82-228859.
Also available in set of 23 reports PC E99, PB82-228677.

Keywords: *Financial management, Economic impact, Credit, Liabilities, *Small businesses, Financial services, Loans.

The author in this study discusses the effects of credit cards on credit in general, as well as the advantages and disadvantages of credit card acceptance by small businesses. To illustrate the cards' effect on credit the author points out that the ratio of consumer credit to retail sales has remained about constant for the period of 1969 through 1979. However, the amount of credit retailers carry, as accounts receivables, has declined in relative terms over the same period. This may be attributed to the rapid growth of bank card credit. As far as small businesses are concerned, the benefits of accepting bank cards include: reduced cost of credit operations, fewer losses, and a wider customer base.

PB82-228859/GAA PC **A05**/MF **A01**
Interagency Task Force on Small Business Finance, Washington, DC.
Studies of Small Business Finance: The Impact of Bank Regulation on Small Business Financing,
Harry P. Guenther. Feb 82, 81p* ITFOSBF-82/18
See also PB82-228842, and PB82-228867.
Also available in set of 23 reports PC E99, PB82-228677.

Keywords: *Financial management, *Banking, Economic impact, Credit, Risk, *Small businesses, Loans, Financial services.

The study is a detailed investigation of how government regulations restrict banks' abilities to finance small businesses. At the heart of the problem is the perception of some bankers and especially regulators that small businesses pose a greater risk than large businesses. The author states that this is not necessarily true but that there is no hard evidence that reflects the rate of failure between small and large businesses. Most regulations are designed to avert risk. Some, in their attempt to avert risk, actually prevent a bank from reducing the risk of a given loan.

PB82-228867/GAA PC **A02**/MF **A01**
Interagency Task Force on Small Business Finance, Washington, DC.
Studies of Small Business Finance: Lease Financing: An Attractive Method of Financing for Small Firms,
Oswald D. Bowlin. Feb 82, 17p* ITFOSBF-82/19
See also PB82-228859, and PB82-228875.
Also available in set of 23 reports PC E99, PB82-228677.

Keywords: *Financial management, Cost analysis, Assets, Risk, *Small businesses.

A large increase in the use of leasing has occurred in the last fifteen years. This is primarily due, according to the author, to high interest rates keeping firms out of the long-term capital markets. The study states that leasing can produce many benefits over the purchase of the same asset. The cost of leasing can be lower than the cost of purchasing due to a wide variety of tax and purchasing advantages on the part of the lessor. Additional advantages to both parties include: reduced default risk, avoidance of technological obsolesence, and built-in financing. The study concludes that a lease offers significant advantages, especially to a small firm that has difficulty obtaining financing.

PB82-228891/GAA PC **A03**/MF **A01**
Interagency Task Force on Small Business Finance, Washington, DC.
Studies of Small Business Finance: Changes in Commercial Banking Structure and Small Business Lending,
Bernard Shull. Feb 82, 43p* ITFOSBF-82/22
See also PB82-228883, and PB82-228909.
Also available in set of 23 reports PC E99, PB82-228677.

Keywords: *Banking, *Financial management, Economic impact, Credit, Finance, Banks(Buildings), *Small businesses, Financial services, Loans, Holding companies.

The structure of commercial banking has changed dramatically in the past twenty years. These changes include: the growth of branch banking and bank holding companies, an increase in number and decrease in concentration of local banking markets, and the growth of foreign banks operating in the domestic market. In the study, the author investigates the effect of these changes on lending to small businesses.

PB82-229063/GAA PC **A16**/MF **A01**
California State Water Resources Control Board, Sacramento.
Wastewater Reuse for Groundwater Recharge: Proceedings of the Symposium Held on September 6-7, 1979 at the Kellogg West Center for Continuing Education, California State Polytechnic University at Pomona,
Takashi Asano, and Paul V. Roberts. May 80, 360p SWRCB-3
Prepared in cooperation with Stanford Univ., CA. Dept. of Civil Engineering.

Keywords: *Sewage treatment, *Ground water, *Waste water reuse, *Microbiology, Salinity, Public health, Water reclamation, International relations, Policies, Saline soils, Desalting, Hydrology, Aquifers, Percolation, Water supply, Water conservation.

This publication reports the proceedings of a symposium which addressed technical and policy issues related to water reclamation for groundwater recharge. Issues included are: Health and water issues; treatment reliability and monitoring; fate of micropollutants in groundwater; groundwater recharge practices - international and U.S. case studies; panel discussion on policy issues and a symposium summary.

PB82-229279/GAA PC **A02**/MF **A01**
Carnegie-Mellon Univ., Pittsburgh, PA.
Vulnerability of Transportation and Water Systems to Science Hazards (Abstracts of Theses),
D. Bresko, and R. A. Shimizu. 1980, 16p NSF/RA-800637
Grant NSF-PFR75-20977

Keywords: *Earthquakes, *Transportation, Abstracts, Transportation models, *Water supply, Cost analysis, Water distribution, Theses, Probability theory, *Earthquake engineering.

A methodology for quantifying seismic risk to lifeline systems, specifically, water and transportation networks, was developed and demonstrated. The measure of seismic risk was defined as the annual probability exceedance function for system loss, in dollars, where system loss is the sum of repair costs and user losses. User loss was obtained by implementing a network analysis with demand functions established as the economic measure of service benefit. The area under the demand function provided a measure of the loss in user benefits. Procedures from operations research were transferred to a numerical seismic hazard simulation. Some new applications for probabilistic graph theory were developed in the process. Example applications culminated in a water system analysis based upon the Salt Lake City system, and a transportation system analysis of the eastern corridor of Pittsburgh. In all examples studied, user losses were, on the average, of the same order or magnitude as repair costs. In the absence of any specific analysis, the total lifeline loss may be roughly estimated as a doubling of the repair costs themselves.

PB82-229303/GAA PC **A15**/MF **A01**
Alaska Sea Grant Coll. Program, Fairbanks.
Proceedings of the North Pacific Aquaculture Symposium, Held in Anchorage, Alaska, August 18-21, 1980, and Newport, Oregon, August 25-27, 1980,
Brenda R. Melteff, and Richard A. Neve. Jan 82, 349p ASG-82-2, NOAA-82060307
Grant NA81AA-D-00009

Keywords: *Aquaculture, *Ecology, Animal physiology, Genetics, Respiration, Breeding, Metabolism, Diets, Nutrients, International law, Animal diseases, United States, Japan, Canada, Sea Grant Program.

In 1979 scientists from Canada, Japan, U.S.S.R. and the U.S.A. agreed to the concept of a four nation scientific exchange in the field of aquaculture. The University of Alaska in cooperation with Oregon State University and the University of Washington hosted this scientific exchange. The proceedings includes 40 papers which are divided into ten topic areas: marine ecological interaction, aquaculture, lake enhancement, environmental stress and fish quality and survival, genetic problems in salmon enhancement, physiology of smoltification, nutrition requirements of Pacific salmon, advances in shellfish culture, disease distribution in Pacific salmon, and international law problems of salmon management.

PB82-229329/GAA PC **A03**/MF **A01**
Albemarle County Medical Society, Charlottesville, VA.
Optimization Models for Management Decision-Making: Executive Summary and Final Report.
Rept. for 1 Sep 80-30 Nov 81,
Edward C. Wilson. 1982, 37p NCHSR-82-47
Grant PHS-HS-02738

Keywords: *Information systems, *Health, *Management techniques, *Health planning, Models, Decision making, Problem solving, Computer programming, Diarrhea, Management information systems.

The project was devoted to the development of a methodology for a computer-based medical information system that would provide relevant information useful to physicians in problem solving, while accommodating a wide range of user preferences. An algorithm for the prototypical problem, acute diarrhea in adults, has been developed, validated, and evaluated which attains these goals. The software for the system is written in PASCAL-M and is operative both in microcomputer and minicomputer environments.

PB82-229451/GAA PC **A14**/MF **A01**
Birch and Davis Associates, Inc., Silver Spring, MD.
Guide to Development of Health Maintenance Organizations.
Mar 82, 318p DHHS/PUB/PHS-82-50178
Contract PHS-282-81-0049CG

Keywords: *Health planning, *Health care delivery, *Health, Guidelines, Development, Organizations, Management engineering, Operations, Marketing, Finance, Delivery of health care.

The primary purpose of the Guide is to serve as a resource document for persons interested in developing HMOs. In addition, managers of operating HMOs will find it an invaluable reference for themselves and a training tool for their boards of directors and staff. The Guide presents a comprehensive description of the five components of HMO operations, and most importantly, devotes considerable attention to the interrelationships between the components and the challenge management faces in effectively integrating them. These operational components, or technical areas, are: legal, management/organization, health care delivery, marketing and finance. Efficient and effective coordination of the HMO's systems in the five key technical areas promotes the earnings maximization objective.

PB82-230368/GAA PC **A06**/MF **A01**
Research Triangle Inst., Research Triangle Park, NC. Center for Technology Applications.
Guidebook for Assessing Stitching Room Innovations in Footwear Manufacturing.
Foreign market survey rept. (Final),
Leo W. Weisbeck, and George M. Barr. Jun 82, 109p ITA-82-26-073
Grants EDA-99-26-09881-10, EDA-99-26-07073-10
Prepared in cooperation with Kaplan (J. B.) and Co., Inc. U.S. sales only for 8 months. Available to foreign addressees in Mar 83.

Keywords: *Footwear, Sewing machines, *Management planning, Process control, Management control reports, Production rate, Guidelines.

Through this guidebook footwear manufacturers can assess their stitching room operations for innovation opportunities in an organized and consistent manner. Management's role in the stitching room is addressed, as well as an implementation scenario describing steps that a firm can take in implementing innovation and a hypothetical case study illustrating the assessment process.

PB82-230467/GAA PC **A05**/MF **A01**
Transportation Research Board, Washington, DC.
Underwater Inspection and Repair of Bridge Substructures,
Final rept.
H. C. Lamberton, Jr., Alfredo J. Sainz, Robert A. Crawford, William B. Ogletree, and James E. Gunn. Dec 81, 86p TRB/NCHRP/SYN-88, ISBN-0-309-03407-8
Also pub. in ISSN-0547-5570. Library of Congress catalog no. 81-85777. Sponsored in part by American Association of State Highway and Transportation Officials, Washington, DC., and Federal Highway Administration, Washington, DC. Report on National Coopera-

tive Highway Research Program, Synthesis of Highway Practice.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC 20418.

Keywords: *Bridges, *Maintenance, Underwater foundations, Underwater swimmers, Divers, Diving suits, Guidelines.

This synthesis will be of special interest to bridge maintenance engineers and others concerned with the inspection and repair of bridge elements below the waterline. Problems with substructures are identified, and procedures, equipment, and techniques currently used for underwater inspection are evaluated. The methods and materials used for maintenance and repair of bridge substructures below the waterline are also described.

PB82-230566/GAA PC **A03**/MF **A01**
California State Univ., Chico.
Macroeconomic Implications of Energy Policy.
Final rept.,
David E. Gallo. 15 Sep 80, 50p CAEC-110-80-004, , CAEC-95

Keywords: *Energy, *Economic analysis, Government policies, Fixed investment, State government, Capital, Financing, Labor estimates, *Energy conservation.

The report examines the macroeconomic impacts of rising energy prices and the implications on state energy policy. The industrial sector is faced with rising energy prices and a very energy inefficient capital stock. Industry is also constrained by the availability of financial capital. A review of the empirical data shows that in the short-run, this situation has a negative effect on capital investment and leads to greater substitution of labor. This seems to indicate that there are limited financial opportunities for short-run energy conservation within the existing capital stock. The long-run situation, however, offers the potential for significant reductions in energy use, by replacement and new investment in energy efficient plant and equipment. This again is within the limits of the overall supply of financial capital. State energy policy should be directed toward incentives and regulations tailored specifically to encourage investments in energy efficient capital. Reallocating the existing stock of financial capital in this manner would be more effective than attempts to increase the aggregate supply of financial capital.

PB82-231234/GAA PC **A08**/MF **A01**
Rexnord, Inc., Milwaukee, WI.
Engineering Control of Occupational Health Hazards in the Foundry Industry: Instructor's Guide.
Final rept.,
Robert C. Scholz. Aug 81, 159p
Sponsored in part by National Inst. for Occupational Safety and Health, Cincinnati, OH.

Keywords: *Safety, *Air pollution, *Occupational safety and health, *Industrial plants, Ventilation, Occupational diseases, Education, Air pollution, Hazards, Environmental engineering, Indoor air pollution, Occupational health services, Continuing education.

This manual contains instructional resource material for a six-hour course module covering the engineering control of occupational health hazards in the foundry industry. The intended primary audience for the course is technical personnel responsible for developing and implementing engineering solutions to occupational health problems. The purpose of the course is to teach the principles and concepts underlying engineering control, through evaluation and discussion of in-place and functioning control measures found in industry. Prior to discussion of control measures, basic foundry processes are briefly described as well as foundry air contaminants and their sources and modes of dispersion. Engineering control measures include material substitution, process isolation, and exhaust ventilation. Maintenance and monitoring of engineering control system performance is also discussed, in addition to housekeeping, and research and development for new and improved engineering control techniques.

PB82-231309/GAA PC **A05**/MF **A01**
Miami Univ., Oxford, OH.
Effect of Total Water Reuse and Alum Control on First Pass Retention.
Final rept. 1 Apr 80-31 May 81,
Michael D. Strutz. Mar 82, 97p EPA-600/2-82-012

Keywords: *Paper industry, Performance evaluation, Water pollution control, Design criteria, *Waste water reuse.

Product quality deterioration, caused by poor wet end control and the resulting build up of dissolved inorganic and organic contaminants, has hampered achieving complete water reuse in paper manufacturing. By using pulp-derived dissolved organic material, the study makes use of a dynamic retention/drainage jar to show the negative effects of these compounds on retention. Alum control is investigated as a means of improving retention in closed whitewater systems through literature review and experimentation. A retention control strategy for total water reuse is proposed. It is based on the measurement and manipulation of alum concentrations in the stock chest; in low shear systems where no polymer is used, to control the electrokinetic balance for proper coagulation, and in high shear systems where polymers are used to eliminate the negative effects due to alum/polymer interactions.

PB82-231663/GAA PC **A10**/MF **A01**
Thermo Electron Corp., Waltham, MA.
Development of Solar-Assisted Gas-Fired Appliances: Phase II.
Final rept. Dec 80-Nov 81,
K. G. Hagen, A. Levine, J. M. Colarusso, and A. I. Zakak. Dec 81, 215p TE4274-160-82, GRI-81/0017
Contract GRI-5014-343-0189

Keywords: *Solar energy, Utilization, *Drying, Dehumidification, Evaluation, Commercial sector, *Solar drying.

An evaluation of applying solar assistance to commercial laundry drying and supermarket dehumidification was accomplished. The laundry drying project included experimental evaluation of the transient and steady-state characteristics of the hot air produced by an air-heating solar collector; experimental evaluation of the performance characteristics of a gas-fired laundry dryer as affected by varying the inlet air temperature and humidity; and an assessment of the characteristics of commercial laundries in relation to the potential commercialization of the solar-assisted dryer concept. The supermarket dehumidification project included an assessment of the relative latent and sensible cooling requirements as a function of geographic location; typical design studies of the performance and cost effectiveness of desiccant dehumidification systems in this application; and the incremental effectiveness of solar assistance to desiccant regeneration. In both projects, the solar-assist feature is, at best, marginally cost effective, including incentives, in the near term; however, the gas-fired only desiccant dehumidification concept is shown to be a potentially attractive alternative to vapor compression dehumidification with a potential for widespread application.

PB82-232414/GAA PC **A14**/MF **A01**
National Research Council, Washington, DC.
Ecological Aspects of Development in the Humid Tropics.
1982, 307p* ISBN-0-309-03235-0
Library of Congress catalog card no. 82-3620. Sponsored in part by Agency for International Development, Washington, DC., and National Park Service, Washington, DC. See also PB82-213489.

Keywords: *Ecology, *Natural resources, *Tropical regions, Agriculture, Forestry, Soils, Surface waters, Regional planning, Vegetation, Atmospheric temperature, Elevation, Distribution(Property), Biomass, Primary biological productivity, Bioclimate.

This 297-page report, much of it extensively documented with citations to published literature, indicates the chief patterns through which people utilize the humid tropics, provides a concise description of humid tropical ecosystems, and focuses on certain critical aspects of the situation -- renewable natural resources, germplasm resources, agriculture, forested lands, soil, and surface water. There is a brief treatment of regional development as seen from an ecological perspective.

PB82-234568/GAA PC **A11**/MF **A01**
Colorado State Univ., Fort Collins. Engineering Research Center.
Watercourse Improvement Manual.
Technical rept.,
Thomas J. Trout, and W. Doral Kemper. 1980, 244p
Water Management-TR-58, AID-PN-AAJ-012
Grant AID/ta-C-1411

Keywords: *Irrigation, *Pakistan, Ditches, Water distribution, Farms, Manuals, Soils, Permeability, Maintenance, *Water supply, Developing country application.

In the arid and semiarid regions which comprise 50% of the world's arable land, water is the critical input on which food production increases depend. This manual discusses processes (of interest to planners) and techniques (of use to engineers, economists, and sociologists) to improve the efficiency of tertiary irrigation conveyance systems (ditches, laterals, and other small watercourses) which convey water from large canals to individual farms. Although the procedures outlined in the manual were developed on the basis of conditions in Pakistan, they are applicable where similar conditions obtain.

PB82-234592/GAA PC **A04**/MF **A01**
Florida Univ., Gainesville. Dept. of Animal Science.
Agricultural Sector Assessment: Livestock Subsector for Haiti,
Joseph H. Conrad. 1979, 75p AID-PN-AAH-958
Contract AID/la-C-1261

Keywords: *Agriculture, *Crops, *Livestock, *Haiti, Management, Land use, Manpower, Pasture, Farming, Leguminous plants, Forage grasses, Production, Developing country application.

Livestock production, although often studied independently of other agricultural activities, is closely linked to cropping systems and to the use of land and labor resources. This report assesses the livestock subsector in Haiti as an integral part of the country's crop/farming system and suggests strategies for Government of Haiti (GOH) action. The first section examines the diversity of livestock types in Haiti's five departments and the four most commonly used management methods--free roaming, staking out, open range herding, and fenced pasture. The author advocates the inclusion of livestock enterprises in farming systems to improve farm efficiency, food production, and profitability.

PB82-235516/GAA PC **A14**/MF **A01**
Bureau of Mines, Washington, DC.
Minerals Data Source Directory.
Information circular/1982.
May 82, 302p BUMINES-IC-8881
Library of Congress catalog card no. 82-600142.

Keywords: *Information sources, *Minerals, National government, Directories, Industries, Commerce, Consumption.

The Minerals Data Source Directory is a compilation of descriptive information on the availability, content, and location of minerals data in the Federal Government. It is intended to assist Government personnel and the general public in locating and acquiring minerals information. Included in the Directory are descriptions of data bases, publications, information systems, and information offices containing data pertaining to all aspects of mineral production, consumption, trade, and related information. These mineral data sources include the Federal agencies such as the Department of the Interior's Bureau of Mines and Geological Survey whose major mission is the collection and dissemination of mineral information. Also included are agencies such as the Departments of Agriculture, Commerce, Labor, State, and Treasury, and the Central Intelligence Agency, whose primary mission is the collection of data in nonmineral subject areas, but in which the mineral industry is a component.

PB82-236571/GAA PC **A13**/MF **A01**
National Water Supply Improvement Association, Ipswich, MA.
Role of Desalting Technology in Water Supply, Wastewater Reuse and Industrial Applications: A Compilation of Papers Presented at a Series of Technology Transfer Workshops.
Final rept.
1981, 278p* W82-05543, , OWRT-C-80360-T(8709)(1)
Contract DI-14-34-0001-8709

Keywords: *Desalination, *Water supply, *Industrial wastes, Technology, Sea water, Recirculation, National government, State government, *Waste water reuse, Reverse osmosis.

A compilation of papers presented at four 1978-79 technology transfer workshops on 'The Role of Desalting Technology in Water Supply, Wastewater Reuse and Industrial Applications' is presented. The material covered is focused towards the enhancement of water resources through technological applications of water demineralization. The papers are segregated into three major categories: overview; case histories; Federal and State programs. Participants of the workshops represent a cross-section of the water desalting industry, including engineering consultants, Federal, State, and local water engineers and managers, and representatives of water treatment equipment. As availability of usable water resources decreases and water demand increases, planners must consider greater use of advanced technologies for desalination and wastewater reclamation. Demineralization of brackish ground and domestic wastewater and seawater conversion are existing activity areas that need technological and practical growth. Topics considered include: desalting processes and pretreatment; wastewater reuse and groundwater recharge; reverse osmosis operations; industrial wastewater recovery through vapor compression evaporation; current and future desalting technology; desalination programs of the U.S. Department of Interior's Office of Water Research and Technology; and desalting operations in various localities (Virginia, Arizona, Texas, Colorado, California).

PB82-236993/GAA PC **A08**/MF **A01**
Ebon Research Systems, Washington, DC.
Emerging Technologies for the Control of Hazardous Wastes.
Final rept.,
Barbara H. Edwards, John N. Paullin, and Kathleen Coghlan-Jordan. Mar 82, 158p* EPA-600/2-82-011
Contract EPA-68-03-2787

Keywords: *Waste disposal, Technology, Surveys, Oxidation, Fluidized bed processing, Fused salts, Incinerators, Catalysis, Ultraviolet radiation, Economics.

Investigations were conducted of new and emerging technologies for the disposal of hazardous wastes. These methods involve new technologies or a recent variation of an established one. In addition, a questionnaire survey was made of potential users of hazardous waste information. The need for a data base for emerging hazardous waste technologies and/or a newsletter was evaluated. Information on the emerging technologies was acquired by computerized search, library searching, and personal contacts. The emerging technologies discussed include molten salt combustion, fluidized bed incineration, high energy electron treatment of trace organic compounds in aqueous solution, the catalyzed wet oxidation of toxic chemicals, dehalogenation of compounds by treatment with ultraviolet (UV) light and hydrogen, UV/chlorinolysis of organics in aqueous solution, the catalytic hydrogenation-dechlorination of polychlorinated biphenyls (PCB's), and ultraviolet/ozone destruction. Theory, specific wastes treated, and economics are discussed.

PB82-237041/GAA PC **A09**/MF **A01**
Radian Corp., McLean, VA.
Source Test and Evaluation Report: Alcohol Facility for Gasohol Production.
Final rept.Oct 78-Feb 80,
R. M. Scarberry, M. P. Papai, Paul E. Mills, and Thomas J. Powers, III. Apr 82, 199p EPA/600/7-82-018
Contract EPA-68-03-2667

Keywords: *Ethanol, *Industrial plants, Blends, Fermentation, *Environmental surveys, Regulations, Design criteria, Performance evaluation, *Gasohol.

This study defines the requirements for environmental sampling and analysis of alcohol-producing facilities capable of supporting a Gasohol industry and applies these requirements to the environmental characterization of an alcohol plant. This document includes a conceptual design of a grain alcohol plant using a coal-fired boiler that is projected to be typical of future plants which will support a Gasohol industry. Environmental control options are also discussed based on a comparison of alcohol plant stream compositions with environmental regulations. The results of this study provide preliminary information on the environmental consequences of large-scale fermentation ethanol plants which will provide alcohol for Gasohol.

PB82-237124/GAA PC **A12**/MF **A01**
New York State Dept. of Transportation, Albany.
Energy Impacts of Transportation Systems Management Actions.
Final rept.
Oct 81, 256p DOT-I-82-4
Contract UMTA-NY-09-8006

Keywords: *Transportation management, *Energy, Instructional materials, *Traffic engineering, Buses(Vehicles), Surveys, Carpools.

The document is a handbook of simple analysis techniques that can be used to assess the direct energy impact of transportation systems management (TSM) actions. It contains step-by-step instructions to complete worksheets that have been included. Sample case studies are also included which demonstrate the use of the analysis procedures. TSM actions discussed include computer signal systems, ramp metering, carpooling, one-way streets and other traffic operations changes, parking management, pricing procedures, shuttle bus services, park-and-ride operations, and transit marketing. The techniques covered require minimum data input, reasonable staff time and expertise, and no computer use. They should therefore appeal to a variety of user groups.

PB82-237132/GAA PC **A07**/MF **A01**
Maryland State Highway Administration, Brooklandville. Bureau of Research.
Evaluation of Epoxy Coated Reinforcing Steel in Bridge Decks.
Interim rept.,
K. Satinder, and P. E. Munjal. Mar 81, 139p FHWA/MD-82/03

Keywords: *Bridges, Reinforcing steels, Protective coatings, Corrosion prevention, Evaluation.

This report presents the evaluation of the effectiveness of epoxy coated reinforcing steel in bridge decks. It describes the procedures applied to evaluate the effectiveness. A comparison of the cost per pound of epoxy coated reinforcing steel which includes cost of steel, coating, shipping and placing in bridge decks, is made with the conventional steel. Electrical resistance and potential readings were observed each year for five years and are included in this report. Also chloride ion content analysis on Category I bridge decks was made which indicated that the concentration at the rebar level has not reached to the threshold level of active corrosion. Condition surveys of all the Category II bridge decks were done each year and no sign of deterioration has been noticed so far, i.e., scaling and spalling. Some hairline cracks were noticed which have been explained in the report.

PB82-237504/GAA PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
New Technologies to Raise Agricultural Efficiencies.
Agriculture information bulletin,
Robert G. McElroy, and Kenneth R. Krause. Aug 82, 47p* AIB-453

Keywords: *Farming, *Agriculture, *Agricultural machinery, Plant genetics, Cultivation, Harvesting, Animal diseases, Farm crops, Greenhouses, Livestock, Hybridization, Policies, Tractors, Harvestors, Swine, Genetic engineering.

New technologies and continuing reseach have poised American agriculture on the threshold of a new technological era. Genetic engineering and improvements in plant and animal breeding promise new high-yield plants and animals. Innovations in chemistry promise higher crop yields and improved treatment of animal diseases. New machines and equipment will significantly increase farm size and efficiency. To be implemented, however, the new technologies will have to demonstrate their efficiency and safety.

PB82-237702/GAA PC **A04**/MF **A01**
Louisiana Dept. of Transportation and Development, Baton Rouge. Research and Development Section.
Evaluation of Drainage Pipe by Field Experimentation and Supplemental Laboratory Experimentation.
Interim rept. no. 3, Jul 72-Nov 81,
William H. Temple, Masood Rasoulian, and Bruce J. Gueho. Nov 81, 59p RR-154, FHWA-LA-82/154
See also PB-283 681.

Keywords: *Pipes, *Corrosion, Galvanized materials, Zinc coatings, Steels, Aluminum, Durability, Field tests, pH, Electrical resistivity, Soil properties, Culverts, Louisiana.

This study represents an investigation of the durability properties of coated and uncoated, corrugated, galvanized steel and aluminum drainage pipe in Louisiana. The highly corrosive environments in some areas of the state make durability requirements of metal pipe as critical as strength requirements. Research and maintenance personnel of the Department installed ten types of metal drainage pipes at each of ten locations in 1973. An eleventh type of drainage pipe was added to each location for evaluation in 1975. In 1977 the investigators installed the battery of test culverts at another test site where the environment differed from that of the previous ten locations. Research personnel selected the test sites based on geographical location and on the pH and electrical resistivity values of the soil and effluent.

PB82-237850/GAA PC **A08**/MF **A01**
National Bureau of Standards, Washington, DC.
Symbols for Industrial Safety.
Final rept.,
Belinda L. Collins, Neil D. Lerner, and Brian C. Pierman. Apr 82, 158p NBSIR-82-2485
Sponsored in part by National Inst. for Occupational Safety and Health, Morgantown, WV.

Keywords: *Industrial plants, Coding, Comprehension, Perception, Visibility, Accuracy, Communicating, Standards, Visual perception, *Occupational safety and health.

A four phase evaluation of a set of selected industrial worksite symbols is described. The four phases involved identification of 33 key safety messages, selection of candidate symbols for each message, evaluation of the understandability of the candidate symbols, and determination of the preference for the 87 candidate images, using both industrial and nonindustrial (naive) personnel.

PB82-237892/GAA PC **A04**/MF **A01**
National Marine Fisheries Service, Seattle, WA.
Proceedings of the U.S.-Japan Meeting on Aquaculture (6th), Santa Barbara, California, August 27-28, 1977.
Technical rept.,
Carl J. Sindermann. Mar 82, 72p NOAA-TR-NMFS-CIRC-442, NOAA-82051005
See also report dated 1975, PB-260 452.

Keywords: *Fishes, Animal nutrition, *Aquaculture, Feeding stuffs, Crustacea, Salmon, Diets, Larvae, United States, Japan, Proteins, Circulation, Growth, Fatty acids, Phytoplankton, Sea grasses, Algae, Aquatic plants, Sea Grant program, Macrobrachium rosenbergii, Homarus americanus.

A collection of five papers constitute the Proceedings of the Sixth U.S.-Japan Meeting on Aquaculture, held in Santa Barbara, California on August 27-28, 1977. The papers presented by Japanese panel members are: Information on the culture of phytoplankton for aquacultural needs in Japan; Recent problems of nori (Porphyra spp.) culture in Japan; and the present status of brown algae culture in Japan. Papers presented by U.S. panel members are: The use of phytoplankton for aquaculture needs--a status report and Seaweed cultivation: a review.

PB82-237900/GAA PC **A17**/MF **A01**
De Leuw, Cather-Parsons and Associates, Washington, DC.
Northeast Corridor Improvement Project Task 211: B and P Tunnel Polymer Concrete Field Trials, Baltimore, Maryland.
Final rept. Feb 80-Feb 82.
Feb 82, 376p FRA-RNC-82-1
Contract DOT-FR-76048

Prepared in cooperation with Silikal North America, Inc., Bridgeport, CT.

Keywords: *Plastics, *Rail transportation, Concrete, Polymers, Portland cements, Footings, Precast concrete, Materials tests, Field tests, Maryland, Baltimore(Maryland).

The report details activities, test results, construction techniques, and other pertinent data and information developed in connection with the Baltimore & Potomac (B&P) Tunnel polymer concrete field trials. The field trials were conducted for two purposes. A primary purpose was development of the equipment, construction techniques, and experience necessary to effectively design, plan, and estimate costs for the B&P Tunnel invert rehabilitation. Another primary purpose was to obtain sufficient information about polymer material to determine those characteristics required for rehabilitation of the tunnel invert.

PB82-239500/GAA PC **A04**/MF **A01**
Puerto Rico Univ., Rio Piedras. Agricultural Experiment Station.
Resumen Bibliografico de los Trabajos de Investigacion Sobre la Utilizacion de Algunas Cosechas Tropicales Llevados a Cabo en el Laboratorio de Tecnologia de Alimentos, 1951-1979 (An Annotated Bibliography of Tropical Crops Processing Research Conducted at the Food Technology Laboratory, 1951-1979),
F. Sanchez Nieva. Aug 80, 75p PUB-136
Text in Spanish. See also English version, PB82-239492.

Keywords: *Crops, *Food, *Fruits, *Tropical regions, *Food processing, Citrus fruits, Dehydration, Cold storage, Frozen foods, Milk, Coffee, Microbiology, Vegetables, Sugar cane, Fermentation, Vitamins, Developing country application.

This annotated bibliography covers processing research conducted on the banana, cassava, chironja, citron, coconut, coffee, frozen dinners, guava, mango, papaya, pigeon pea, pineapple, plantain, rice, snap bean, soursop, sugar cane, sweet pepper, sweet potato, tamarind, tanier, West Indian cherry, and yam. The types of processing for the various crops include ripening, nectar preparation, dehydration, freezing, cold storage, canning, chemical composition, fruit bars, brine fermentation, peeling, processing coffee harvested with plastic nets, frozen dinners, microbiology, pulp, jelly, syrups, stability of vitamin C in juices and nectars, fried products, starches, and irradiation and lye peeling of yams.

PB82-239542/GAA PC **A10**/MF **A01**
United Planters' Association of Southern India.
United Planters' Associaton of Southern India (UPASI) - Tea Scientific Department: Annual Report 1979, Summaries of Research.
Rept. no. 53 for 1 Jan 79-31 Dec 79,
31 Dec 79, 205p

Keywords: *India, *Farming, *Crops, Developing countries, Irrigation, Quality control, Chemistry, Entomology, Food processing, Developing country application.

The major areas of activity at the Institute are in the field of drip irrigation; No tillage replanting; Botany; Chemistry; Entomology; Plant pathology; and Tea technology. In the tea technology area, research was conducted on stabilization of tea brew; Effect of shade on quality of tea; Tea chest lining material; Standardization of methods for estimation of tea constituents; Effect of addition of reconditioning dust in black tea manufacture; and dry matter content of Colonial tea leaves. The research findings in all activity areas are presented in this report.

PB82-240953/GAA PC **A05**/MF **A01**
Oklahoma State Univ., Stillwater. Dept. of Agricultural Economics.
Records for Small Farms in Honduras: A Development and Critique,
Michael L. Hardin, Loren L. Parks, Kurt A.
Rockeman, and Joseph E. Williams. Aug 80, 90p 80-3, AID-PN-AAJ-087
Contract AID/ta-CA-1
Prepared in cooperation with Colorado State Univ., Fort Collins.

Keywords: *Farming, *Financial management, *Agricultural economics, *Honduras, Surveys, Records, Production, Livestock, Profits, Farm crops, Manpower, Prices, Developing country application.

Farm records measure and monitor the heartbeat of a farm business and are a farm manager's primary tool in determining farm profitability, measuring progress, and gaining information for decisionmaking. This report, part of the Small Farmer Credit Project, summarizes the design and implementation of a small farmer recordkeeping system in Honduras. The record system was designed to obtain information needed to identify production coefficients, prices, farm resources, and borrowed resources; determine each crop/livestock enterprise's profitability, source and cost of labor, source and amount of cash flow, and consumption of farm products; and develop financial statements.

PB82-240961/GAA PC **A07**/MF **A01**
Oklahoma State Univ., Stillwater. Dept. of Agricultural Economics.
Training Programs for Agricultural Development Bank Personnel: The Honduras Experience,
Loren L. Parks, and Daniel D. Badger. Aug 80, 133p 80-2, AID-PN-AAJ-088
Contract AID/ta-CA-1
Prepared in cooperation with Colorado State Univ., Fort Collins.

Keywords: *Banking, *Farming, *Training, Specialized training, Developing countries, Agricultural engineering, Credit, Farms, Livestock, Budgeting, Honduras, Developing country application.

This report focuses on developing and using standard enterprise budgets to aid agricultural development banks, specifically, the National Agricultural Development Bank of Honduras, to evaluate loans. The Bank's previous budget system had several faults. Budgets were not uniformly prepared, excluded fixed costs and some other variables, ignored regional differences, and were not prepared for livestock loans. The new budget system provides basic data required for economic analyses (e.g., farmer's loan repayment capacity, cash flow, capital needs). It is designed to be simple for Bank personnel to use, accurate yet low cost, rapid, and flexible.

PB82-240979/GAA PC **A05**/MF **A01**
Oklahoma State Univ., Stillwater. Dept. of Agricultural Economics.
Enterprise Budgets: A Multiple Use Data Base for Agricultural Banks in Developing Countries,
Loren L. Parks, Kurt A. Rockeman, and Odell L.
Walker. Aug 80, 77p 80-1, AID-PN-AAJ-086
Contract AID/ta-CA-1
Prepared in cooperation with Colorado State Univ., Fort Collins.

Keywords: *Banking, *Agricultural economics, Finance, Production, Expenses, Banking businesses, Risk, Return on investment, Farms, Honduras, Loans, Financial services, Developing country application.

Enterprise budgets-statements of the particular physical and financial inputs needed to obtain a specified amount of output-plav an important role in institutions that finance agricultural production by providing an ex ante estimate of production costs and returns. This report focuses on developing and using standard enterprise budgets to aid agricultural development banks, specifically, the National Agricultural Development Bank of Honduras, to evaluate loans.

PB82-241241/GAA PC **A04**/MF **A01**
Agency for International Development, Washington, DC.
Peru: CARE OPG Water Health Services Project.
Impact evaluation rept. no. 24,
Joseph Haratani, Ana Maria Viveros-Long, and Ana Maria Becerra Marzano de Gonzales. Oct 81, 55p AID-PN-AAJ-176

Keywords: *Water supply, Developing countries, Water pipes, *Health, Sewers, *Water quality, *Water resources, Project planning, Project development, Communities, *Peru, Developing country application, CARE projects, Health care, Health education, Accessibility, Villages.

Where piped water is a local priority, A.I.D. should be willing to authorize projects aimed solely at improving the accessibility, quantity, and quality of water to the exclusion of other health interventions. This and other lessons found in this report were learned in an AID-funded CARE project to provide piped water, vaccinations, health education, and sewers in Peru's Ancash Department. For a $20 fee and less than 15 cents per month, 2,600 households in the smallest villages received piped water from 29 gravity-fed water systems which supplied 60 liters of potable water per day. The impact was pronounced. Not only did use of piped water for drinking, cooking, and bathing increase, but because women no longer needed to spend 3 hours each day collecting water, there was more time for productive activities such as weaving. Unexpectedly, women also made inroads into the male-dominated social structure by participating in the village juntas which conducted many project activities. Because the project produced lasting tangible benefits, villagers' predisposition to community action was stimulated. On the other hand, the vaccination program was cancelled; there was no indication that health education improved health, and, because of higher installation costs and fewer perceived benefits, only five sewer systems were built.

PB82-241282/GAA PC **A12**/MF **A01**
Checchi and Co., Washington, DC.
Senegal Food and Energy Study: Energy Use and Opportunities for Energy-Related Improvements in the Food System.
Aug 80, 252p AID-PN-AAJ-274
Prepared in cooperation with Brookhaven National Lab., Upton, NY.

Keywords: *Food, *Food supply, *Energy, *Senegal, Developing countries, Food processing, Food industry, Agricultural engineering, Profiles, Forestry, Irrigation, Fertilizers, Windmills, Solar energy, Charcoal, Developing country application, *Energy conservation, Energy requirements, Households, Energy conversion.

The growth of agriculture, the mainstay of Senegal's economy, is contingent upon the acquisition of imported energy. This study examines the key constituents of the Senegalese food system in relation to energy supply and demand. The study first analyzes the food system (crop characteristics, and physical and institutional components) and the energy system (sources, costs, supply/conversion technologies, and consumption patterns). Next, energy-use profiles are provided on the production and distribution processes of millet/sorghum, rice, groundnuts, and fish. Household cooking practices are also discussed. Recommendations to improve irrigation, the second key to increasing food supplies, include funding for low-capacity photovoltaic and solar-thermal systems, setting up windmills in coastal areas, and designing large-capacity solar plants similar to those at Bakel. To save energy at the household level, wood or charcoal cooking stoves must be made more efficient and the use of biogas plants should be studied. To counter the serious depletion of fuelwood, Senegal's main indigenous energy resource, energy-efficient charcoal production should be developed, the charcoal industry reorganized, and afforestation and forest management programs expanded.

PB82-241563/GAA PC **A04**/MF **A01**
New York State Coll. of Agriculture and Life Sciences, Ithaca.
Economic Feasibility of Import Substitution of Livestock Feed in the Caribbean Community.
Cornell international agricultural mimeograph,
Clifton F. Charles, David Blandford, and Richard N.
Boisvert. Jul 80, 54p CIAM-80, AID-PN-AAJ-503
Contract AID/ta-BMA-8

Keywords: *Caribbean, *Animal feeds, *Agricultural economics, *Livestock, Imports, Manpower, *Land use, Sugar, Production, Tariffs, Corn, Developing country application.

Widespread use of import substitution (replacing imported with domestic goods) in the Caribbean Community (CARICOM) makes CARICOM an ideal focus for evaluating the viability of this strategy. This study examines the economic feasibility of import substitution for livestock feed (corn and soya) in CARICOM, with emphasis on the associated costs and implications for land and labor use, sugar production and exports, and foreign exchange balance. Two major conclusions are reached. First, had a corn/soya industry existed in 1975 under a free trade regime, CARICOM corn imports could have been reduced 45%, soya meal imports 46%, and soya oil imports 34%. Secondly, CARICOM land and labor resources are adequate to achieve self-sufficiency in either feed (corn and soya meal) or soya oil, but not in both.

PB82-241571/GAA PC **A07**/MF **A01**
Colorado State Univ., Fort Collins.
Field Evaluation of Methods for Measuring Basin Irrigation Performance.
Technical rept.,
Satyansu S. Kundu, and Gaylord V. Skogerboe. Feb 80, 140p Water Management-TR-59, AID-PN-AAJ-010
Contract AID/ta-C-1411

Keywords: *Project evaluation, *Irrigation, Performance evaluation, Hydraulics, Flow charting, Fluid infiltration, Depth, Water flow, Volumes, Mathematical models, Area, Equations, Water distribution, Field tests, Developing country application, Discharge(Water).

A detailed description of field procedures employed to obtain necessary data for evaluating basin irrigation performances of several irrigation events is outlined. Two analytical techniques are described and used for calculating infiltrated water depths through station-areas delineated by a grid system within the basin. Both techniques require an infiltrometer test and infiltration opportunity time of each station-area during an irrigation event. A modified volume balance technique is described and is used to develop an infiltration equation which should represent the actual infiltration characteristics of the entire basin during an irrigation event.

PB82-241589/GAA PC **A06**/MF **A01**
Colorado State Univ., Fort Collins.
Watercourse Improvement Research in Pakistan.
Technical rept.,
W. Doral Kemper, Wayne Clyma, Gaylord V. Skogerboe, and Thomas J. Trout. Jan 80, 110p
Water Management-TR-56, AID-PN-AAJ-011
Contract AID/ta-C-1411

Keywords: *Irrigation, *Pakistan, Water loss, Porosity, Animals, Insects, Embankments, Earth dams, Soil erosion, Concretes, Vegetation, Plant growth, Maintenance, Channel improvements, Developing country application.

In 1971, Colorado State University (CSU) Water Management Field Party and Pakistani investigators discovered that 45% of all the water in Pakistan's man-made irrigation systems was lost before ever reaching arable land. In 1977, A.I.D. funded a water management research program to provide the basis for future development and redesign of Pakistan's national irrigation system. This report outlines the investigation of and reasons for water loss and the ensuing development of an alternative water management program. The primary causes of water loss were identified as high porosity of upper portions of banks due to burrowing animals and insects; thin, fragile banks near watercourse junctions due to soil borrowing for dams; rising levels of water in the watercourse due to vegetative growth and sedimentation; and difficulty in organizing farmers to perform regular maintenance. Cooperative improvements of earthen channels by farmers using government materials and design, though, had a favorable benefit/cost ratio (3:1) and were eagerly accepted by farmers.

PB82-241704/GAA PC **A22**/MF **A01**
Denver Research Inst., CO.
Appropriate Technology for Development: A Study and Case Histories (Part 1 and 2),
Donald D. Evans, and Laurie Nogg Aler. 1979, 503p
AID-PN-AAH-938
Contract AID-DSAN-C-0062

Keywords: *Technology transfer, *Economic development, *Productivity, Production, Motor vehicles, Food, Roads, Machining, Building materials, Developing country application, Appropriate technology.

The failure of development assistance efforts to lessen poverty, especially for the 800 million, mostly rural people living below the minimum subsistence level, forces consideration of the ability of the technologies used in these efforts to achieve economic development. This book explores recent thought on this question and illustrates the economic effect of technology with 22 case histories drawn from all over the world. Technology is the means used by human beings to change their environment. The term 'appropriate technology' (AT) is used when culturally congenial, least-cost, labor-intensive means are used to meet essential development goals. After analyzing AT's growing importance in U.S. development assistance efforts, the 22 case studies are examined in terms of their human and material resources, the means used to develop these resources, and the environmental effect of this use. Examples of AT provided range from converting automotive fuel from gas to butagaz to developing lime kilns. A 144-item bibliography (1972-79) is attached.

PB82-242355/GAA PC **A05**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Development and Evaluation of Effective Symbol Signs.
Building science series (Final),
Belinda Lowenhaupt Collins. May 82, 99p* NBS-BSS-141
Library of Congress catalog card no. 81-600192.

Keywords: *Communication, Symbols, Safety, Visual communication, Warning systems.

Graphic symbols have recently been widely adopted for sign systems in the United States. Beginning with traffic sign systems, symbols have become widely used for applications ranging from products buildings. In this report a brief history of the development of symbols is given, followed by a review of research on experimental evaluation of symbols. Some of the general advantages and limitations of symbols are discussed, along with graphic considerations essential in the development of effective symbols. Research on symbols for five areas of application--highway, automotive/machinery, public information, product hazard, and safety--is then discussed. Finally, issues in the research and development of more effective symbols are reviewed. These include the need for good graphic design, characteristics of the intended user group, use of shape and color encode information, and general visibility considerations.

PB82-242496/GAA PC **A05**/MF **A01**
Twitchell (Jon)/Associates, San Francisco, CA.
TSM for Major Institutions: San Francisco Experience.
Final rept.
Dec 81, 85p DOT-I-82-11
Grant DOT-UMTA-CA-09-9003

Keywords: *Transportation management, *Urban planning, Marketing, Policies, Parking facilities, Coordination, Systems engineering, California, Ridesharing, Transportation brokerage, San Francisco(California).

This document describes the cooperative efforts of twelve institutions and firms in San Francisco to solve parking and traffic problems by promoting transportation systems management. Participating groups included colleges, hospitals, and a private employer. With a formal transportation broker designated in each institution, the organizations then proceeded to implement or promote TSM strategy elements like ridesharing, improved transit with better marketing and employer support, and supportive parking management policies. The individual brokers also formed an association to share insights and successful techniques, and to continue contacts established earlier in a formal training program. Sales of monthly transit passes were also initiated, although no subsidy was provided. In a 1980 evaluation, the program was perceived as successful.

PB82-243320/GAA PC **A02**/MF **A01**
South Dakota State Univ., Brookings. Water Resources Inst.
Influence of Ozonation on Sulfur, Nitrogen, Chloride and Phosphorous Systems in Public Drinking Water Supplies,
Completion rept. 1 Oct 80-31 Mar 82,
David C. Hilderbrand. May 82, 18p W82-05907, ,
OWRT-B-069-SDAK(1)
Contract DI-14-34-0001-1264

Keywords: *Water treatment, *Potable water, Sulfur, Nitrogen, Chloride, Phosphorous, Water supply, Concentration(Composition).

The use of ozone as a treatment process for public drinking water is of interest because other methods include a concern relative to the ingestion of chloroform and other trihalomethanes. Ozone which decomposes rapidly in water to form oxygen deters the possibility of formation of other hazardous species. Most studies on ozonation have dealt with sterilization, color, taste, and odor removal. This study investigated the effect of ozonation on the concentration of selected phosphorus, sulfur, nitrogen and chloride species present in raw drinking water supplies. The following observations were made. No effect on the concentration of either phosphate or chloride was detected. The concentration of sulfide and sulfite was reduced to below detection limit of the method used when intermediate or high concentrations of ozone was applied. The concentration of sulfate was only slightly elevated corresponding to the conversion of limited amounts of sulfite to sulfate. For the nitrogen system no effect was detected for treatment of samples containing ammonia. The nitrite concentration however was reduced to below the detection limit for the method when intermediate and high levels of ozone treatment were employed.

PB82-244435/GAA PC **A03**/MF **A01**
Florida Inst. of Tech., Melbourne.
Solar Cookers: Test Results and New Designs,
Thomas E. Bowman. 1 Dec 78, 32p AID-PN-AAJ-292
Contract AID/ta-C-1333

Keywords: *Solar energy, Design, Tests, Performance evaluation, Developing country application, *Solar cookers, Solar equipment.

The availability of fuel for cooking has become a major problem in many developing countries. Increased use of charcoal made from native wood can cause deforestation and loss of agricultural land, and most developing countries lack the fuel distribution system necessary for the use of kerosene, gasoline, or liquified petroleum gas. Solar energy, by contrast, is abundant and available. This paper reports on a program to design, fabricate, test, and evaluate solar cookers for possible use as the primary means of cooking by rural families in developing areas. Four Telkes ovens, two Adams cookers, three direct-focusing cookers, two steam cookers, and three combined focusing/oven cookers were tested. These included cookers which were designed by the authors, purchased, or modified/copied from earlier designs.

PB82-244476/GAA PC **A04**/MF **A01**
Agricultural Projects Services Centre, Kathmandu (Nepal).
Rice Production in Nepal: Factors Affecting Adoption of Modern Varieties and Their Effect on Income and Income Distribution.
Research papers 11, 12, and 13,
Bharat B. Karki, Tilak Rawal, and John C. Flinn. Sep 81, 64p AID-PN-AAJ-877
Grant AID/ASIA-G-1199
Prepared in cooperation with Agricultural Development Council, Inc., New York.

Keywords: *Rice, *Wheat, *Productivity, *Agricultural economics, *Nepal, Production, Yield, Plant genetics, Income, Farms, Manpower, Fertilizers, Output, Developing country application

Three short research reports are combined here to present a comprehensive examination of the introduction of modern rice varieties in Eastern Nepal. The titles of the three reports are: An Analysis of Factors Affecting the Adoption of Modern Varieties in Eastern Nepal; The Impact of Modern Varieties of Rice on Farm Income and Income Distribution in Eastern Nepal; and Rice Production in the Tarai of Kosi Zone, Nepal. All three reports are basically economic statistical studies. In the first report modern varieties were found to be higher yielding than local ones, and while total labor inputs were similar, the proportion of hired to total labor was significantly higher with modern varieties. Use of modern varieties yielded a higher net income for the farmers and led to use of more hired labor.

PB82-245382/GAA PC **A02**/MF **A01**
International Inst. of Tropical Agriculture, Ibadan (Nigeria).
Rapid Method of Hand Crossing Cowpeas.
Technical bulletin no. 2,

K. O. Rachie, K. Rawal, and J. D. Franckowiak.
1978, 10p AID-PN-AAH-600
Grant AID/ta-G-1491

Keywords: *Leguminous plants, *Tropical regions, Pollen, Instructions, Temperature, Humidity, Effectiveness, Nigeria, Developing country application.

Cowpeas are generally easier to cross than other grain legumes. Their flowers are large and easy to manipulate, the keel is straight, beaked, and not twisted. There are only a few floral nodes per raceme, which tend to have a low abortion rate, and 8-12 seeds are usually produced per cross. This report presents an effective and rapid method of hand emasculating and crossing cowpeas which was developed at the International Institute of Tropical Agriculture (IITA). The normal crossing technique consists of removing the upper half of the petals starting with a partial cut opposite the stylar and staminal section. Following pollination with a freshly opened flower, the crossed bud remains uncovered. Normally, the emasculation-/pollination process can be accomplished at the rate of 1-2 per minute with a success rate of only 10-20%.

PB82-245622/GAA PC **A05**/MF **A01**
National Health Planning Unit, Accra (Ghana).
Planning and Management of Health Services at the District Level - Manual Number 2.
Jun 79, 100p AID-PN-AAJ-358
Contract AID/afr-C-1116
Prepared in cooperation with Kaiser Foundation, Oakland, CA.

Keywords: *Health, Manuals, Allocations, Resources, Planning, Management, *Health planning, Developing country application.

Faced with a scarcity of resources, how can developing countries deliver health care services that yield maximum results. The key is planning, the systematic and continuous process of allocating resources to achieve objectives. This 'how-to' manual, the second in a series of six publications, is designed to teach health planning at the district level in a developing country setting, based on the experiences of the Ministry of Health of Ghana (MOHG). The three-part 'Health Planning and Management Cycle' is described: (1) In the health assessment phase, health data are collected from all major sources. Next, health/disease problems are identified and prioritized. (2) Health programs are identified for each priority. Especially important is the preparation of annual budgets. (3) Implementation consists of determining organization, staff, and material requirements for all work plan activities; and directing and supervising staff according to the work plan. Finally, a four-step continuous cycle of evaluation is set up.

PB82-245689/GAA PC **A03**/MF **A01**
Devres, Inc., Washington, DC.
Evaluacion de Actividades de Riego en Bolivia (Evaluation of Irrigation Activities in Bolvia),
Joseph F. Harvatin. Feb 80, 46p AID-PN-AAH-333
Contract AID/SOD/PDC-C-0223
See also English version, PB81-220626. Text in Spanish.

Keywords: *Irrigation, *Bolivia, Developing countries, Farms, Topography, Sanitation, Education, Personnel, Project planning, Project management, Developing country application.

The study, written in Spanish, evaluates current irrigation practices and the potential for improving irrigation in Bolivia. Although Bolivia has adequate subterranean and superficial water supplies as well as marked rainy seasons, a lack of funds, few trained personnel, and difficult topography have permitted only a few irrigation projects to be developed. Farmers use primitive irrigation techniques, such as flooding, which are ineffective and promote soil erosion. The use of river water in a number of projects threatens to contaminate crops and spread disease as the water often contains sewage and human wastes. Existing data indicate that well-run irrigation projects could increase farm output 50-100%. Due to limited resources for implementing irrigation projects, priority should be given to vineyards in Tarija, vegetables and alfalfa in Cochabamba, and corn, potatoes, and fruit in the valleys. If large-scale projects are emphasized, management, training, and extension efforts can be developed simultaneously.

PB82-246174/GAA PC **A02**/MF **A01**
Veterans Administration, Washington, DC.
Schistosomiasis in the Veteran.
Technical bulletin,
Harry Most. Sep 47, 13p VA/TB-10-36

Keywords: *Diseases, *Drugs, *Schistosomiasis, Parasitic diseases, Military personnel.

Infection with the three species of human schistosomiasis, or blood flukes was found in military personnel during World War II. They include Schistosoma japonicum, S. haematobium, and S. mansoni. The geographic distribution is outlined in order to assist in identifying those who served in areas where the blood flukes were endemic. The life cycle of the fluke is detailed. In order to be infected, contact must be made with water infested with the free swimming cercariae of the fluke, which have developed in the intermediate host, a snail. The course of the disease, symptoms and diagnosis by clinical and laboratory tests are presented. Treatment by chemotherapy using trivalent antimony, antimony and potassium tartrate (tartar emetic), or fuadin is described. Follow-up treatment is emphasized, and the prognosis for patients with varying levels of the disease is given.

PB82-246422/GAA PC **A02**/MF **A01**
Veterans Administration, Washington, DC.
Management of Vivax Malaria in the Veteran.
Technical bulletin,
Harry Most. 4 Aug 48, 11p VA/TB-10-47

Keywords: *Diseases, *Malaria, *Drugs, Infectious diseases, Parasitic diseases, Therapy.

As a result of military operations in tropical areas during World War II, malaria was a common disease. Atabrine controlled the infections, but relapses were common. General clinical aspects of vivax malaria are described, as well as delayed primary attacks which occur after suppressive medication is discontinued. Vivax malaria can be mistaken for primary abdominal conditions or may have chronic signs and symptoms. Central nervous system manifestations are described, as well as other miscellaneous symptoms. Laboratory testing of blood smears to identify the parasite is the only definitive way to diagnose malaria, and techniques are described. Symptomatic and chemotherapeutic treatments are described, with dosage schedules for acute attacks and for suppression. The cure for vivax malaria relies on a course of drugs, combined quinine-plasmochin and combined quinine-pentaquine, although toxic effects can be troublesome. Accordingly, treatment should be given in hospital with adequate precautions.

PB82-247040/GAA PC **A20**/MF **A01**
Tanzania National Scientific Research Council, Dar es Salaam.
Young Child in Tanzania from Age Seven to Fifteen Years.
c1977, 475p
See also PB82-247032. Errata sheet inserted.

Keywords: *Children, Public health, Education, Developing countries, Africa, *Tanzania, Developing country application, Child health services, Handicapped children.

This is the second part of the study on the yound child in Tanzania. The first covered the child from conception to seven years of age. This part investigated the following aspects: Health; handicapped children; mass media and youth; primary school education; problems of youth and school leavers; and youth activities. Like the first part, this part was commissioned by UNICEF for its internal use as well as to provide recommendations which could be used to improve the situation of children. Some of the main findings of the study were that children who attend school are healthier than those who do not attend; that the parents of school-going children were more enlightened; that anaemia was the most serious problem among school children; and that certain social traditions increase the rate of school drop-outs. Recommendations are given on health, handicapped children, education, and children of the peri-urban areas.

PB82-248196/GAA PC **A99**/MF **A01**
ERA 2000, Inc., Gaithersburg, MD.
Further Mechanization of Egyptian Agriculture.
1979, 647p AID-PN-AAJ-219
Contract AID/NE-C-1513

Keywords: *Productivity, *Agricultural machinery, *Egypt, Social effect, Production, Wheat plants, Upgrading, Cost analysis, Manpower, Pumps, Tractors, Harvesting, Developing country application.

Agricultural mechanization in Egypt stands at a crossroads from which the Government of Egypt (GOE) must decide whether to aggressively intervene or pursue a laissez-faire strategy. This study, aimed to assist the GOE to select the optimal strategy and to highlight possible avenues of A.I.D. assistance (herein proposed at $78.8 million for 1980-84), concludes there exists in Egypt the foundation for a vigorous expansion of mechanization which could increase farm production 47% by 1990 with only a neglible adverse social impact.

PB82-248667/GAA PC **A03**/MF **A01**
Stanford Univ., CA. Inst. for Communication Research.
Networks for Innovation by Local Governments,
Everett M. Rogers, and Kathleen P. Magill. Feb 79, 28p NSF/RA-790765

Keywords: *Technology transfer, Technology innovation, Government policies, Decision making, Networks.

The objectives of this study were (1) to examine the utilization of regional and national networks in the transfer of science and technology (S&T) innovation in local government; and (2) to determine possible strategies that Federal government policy-makers might use to encourage technology innovation in local government. The following topics concerning policy and program decisions are addressed: determination of roles and objectives of the networks and innovation groups; relationships of networks and innovation groups; functions which can be enhanced by stronger linkages; the need for a common secretariat; kinds of information that should be shared; Federal interest and roles in the networks; and the relationship of networks and innovation groups to Federal mission agency activities. Two programs described in detail are: (1) the GBF/DIME Study--a computer-based planning tool that allows analysis of geo-coded data by regional and local governments; and (2) the Dial-A-Ride Study--a demand-responsive system in which a van is dispatched to transport a rider in answer to a telephone request. The nature of local government innovation networks, and their future roles, also are addressed.

PB82-248709/GAA PC **A12**/MF **A01**
Balaban (Miriam), Amsterdam (Netherlands).
Desalination Directory.
c1981, 261p W82-05908, , OWRT-C-90414-T(0401)(1)
Contract DI-14-31-0001-0401

Keywords: *Desalination, Abstracts, *Water treatment.

A first edition of an international directory of participants involved in desalination and water purification is presented. This directory should serve as a central tool to enhance communications among members of the world-wide desalting community. Overviews of activities in desalination and water purification are provided by individuals, organizations, and companies listed in the directory. The directory, hence, provides a useful information network for technology transfer in the desalination and water purification areas. Directory entries are both by alphabetical and geographical listings. A separate alphabetical listing of individuals, their affiliations, and addresses, is also included. Owing to the limitations encountered in preparing an initial directory, the narrative entries reflect the nature and scope of the organizations providing information, but are not necessarily proportional to the size, importance, or level of excellence of the organizations. This first edition also will serve as a checklist so that companies, institutions, and individuals can check their entries on their own merit and in relation to each other. A second edition, under preparation and planned for release in 1-2 years, will also include interests and society memberships of individuals, and a subject index.

PB82-248865/GAA PC **E05**/MF **E05**
Water Research Centre, Stevenage (England).

Investigations of Sewage Discharges to Some British Coastal Waters. Chapter 5: Bacterial Distributions, Part 3.
Technical rept.,
A. L. H. Gameson. c1981, 58p TR-165

Keywords: *Sewage disposal, *Great Britain, *Waste disposal, *Microbiology, Microorganisms, *Coasts, Distribution, Coliform bacteria.

Results of field studies of the distributions of indicator bacteria (mainly presumptive total coliforms) at four sites are reported. These studies were carried out at Deal in 1969 and 1975, off North Foreland in 1967, along part of the North Wales coast in 1973, and at Eastbourne in 1977. (Copyright (c) Water Research Centre, 1981.)

PB82-248972/GAA PC **E03**/MF **E03**
Water Research Centre, Stevenage (England).
Investigations of Sewage Discharges to Some British Coastal Waters. Chapter 5: Bacterial Distributions, Part 4.
Technical rept.,
A. L. H. Gameson. c1982, 61p TR-176
See also Part 2, PB81-237919.

Keywords: *Microbiology, *Waste disposal, *Sewage disposal, *Great Britain, Microorganisms, *Coasts, Distribution, Coliform bacteria, Field tests.

Field studies were carried out at various coastal sites between 1961 and 1977 to obtain a better understanding of the behavior of sewage when discharged to the sea from submarine outfalls and of its effect on water quality, and hence to assist in decisions on schemes for disposal of sewage from coastal areas and on the methods of determining the optimum design for any given objectives. Chapter 5 of the present series of reports has been concerned with variations in bacterial counts in sewage, river discharges, and the sea, and Part 4 is confined to examination of variations in presumptive total coliform counts in the nearshore waters adjacent to sea outfalls. (Copyright (c) Water Research Centre 1982.)

PB82-249160/GAA PC **A05**/MF **A01**
Resources for the Future, Inc., Washington, DC.
Conservation Tillage and Conventional Tillage: A Comparative Assessment.
Final rept. Oct 78-Dec 80,
Pierre Crosson. Apr 82, 88p EPA-600/3-82-027
Grant EPA-R-8060236010

Keywords: *Farming, *Land use, Forecasting, Conservation, Area, Economic factors, Yield, *Soils, Expenses, Weed control, Water supply, Environmental impacts, Trends, Erosion control, Soil conservation, Herbicides, Fertilizers, Tables(Data), Tillage.

The objective of this study is to reach a judgment of the amount of U.S. cropland likely to be in some form of conservation tillage in 2010. The future spread of conservation tillage will be conditioned primarily by farmers' perceptions of its economic advantages relative to conventional tillage and by the society's perceptions of its advantages and disadvantages with respect to the environment. Accordingly, the study first considers the economics of conservation tillage relative to conventional tillage, examining differences between the two technologies in the quantities of resources used and in yields. The conclusion is that conservation tillage typically uses less of certain resources and more of others, but that on balance it requires 5 to 10 percent less expenditure per acre than conventional tillage.

PB82-249491/GAA PC **E06**/MF **E06**
Oxford Univ. (England). Commonwealth Forestry Inst.
Fire Control in Tropical Pine Forests,
A. Wolffsohn. 1980, 103p CFI/OP-17
Also pub. in ISSN-0141-8181.

Keywords: *Pine trees, *Forestry, *Tropical regions, Fuels, Seeds, Mortality, Growth, Hardwoods, Fire prevention, Risk, Hazards, Fire behavior, Silviculture.

Large natural pine forests at frost-free elevations in the tropics are continuous with those of southern U.S.A. and form a single ecological type. Their existence is precariously balanced between a condition in which frequent fires kill all the seedlings and one in which the absence of fire permits the growth of hardwoods under whose shade pine is unable to regenerate. Fire management planning is therefore essential. The occurrence and behavior of fire is considered and the fuel characteristics of the various components of the forest discussed along with the effect of the weather.

PB82-249517/GAA PC **A07**/MF **A01**
Energy Systems International, McLean, VA.
Preliminary Energy Sector Assessments of Jamaica. Volume I: Executive Summary.
Jan 80, 142p ESI/EA-80-0101-1, AID-PN-AAJ-422
Contract AID-523-79-11
See also Volume 2, PB82-249525.
Also available in set of 8 reports PC E99, PB82-249509.

Keywords: *Energy source development, *Energy, *Jamaica, Assessments, Developing countries, Economic analysis, Solar energy, Coal, Electric utilities, Rates(Costs), Developing country application, Bioconversion, Renewable energy sources, Refuse derived fuels.

Because heavy dependence on costly imported fuel has greatly inhibited Jamaica's economic development, USAID/Jamaica and the Government of Jamaica (GOJ) sponsored a preliminary energy assessment to identify and develop viable alternative energy options. Specialized studies included solar energy (commercial/industrial and agricultural), biogas applications, energy conversion from waste, a coal prefeasibility study, and an electric utility rate analysis. Individual studies were published in three volumes (with volume three on renewable energy being in four parts, for a total of six volumes). This first introductory volume provides a lengthy executive summary of the entire assessment.

PB82-249525/GAA PC **A06**/MF **A01**
Energy Systems International, McLean, VA.
Preliminary Energy Sector Assessments of Jamaica. Volume II: Economic Assessment.
Jan 80, 108p ESI/EA-80-0101-2, AID-PN-AAJ-423
Contract AID-532-79-11
See also Volume 1, PB82-249517 and Volume 3, PB82-249533.
Also available in set of 8 reports PC E99, PB82-249509.

Keywords: *Energy, *Jamaica, Assessments, Developing countries, Economic analysis, Solar energy, Coal, Electric power generation, Developing country application, Bioconversion, Renewable energy sources, Energy conversion.

This volume presents an economic assessment of the specialized study areas, reviewing recommendations from the specialized studies in relation to each other and to the GOJ's 5-year Development and Energy Sector Plans. After analyzing the effects of these recommendations on Jamaica's energy situation and economy, the recommendations are integrated and prioritized in a proposed Combined Energy Program (CEP) which is recommended for immediate GOJ implementation. Highest priority items include research, testing, training, and tax structures to encourage solar hot water and agricultural drying systems; installation of small- and medium-size biogas plants; and negotiating joint port usage for a possible coal-fired electricity plant.

PB82-249533/GAA PC **A06**/MF **A01**
Energy Systems International, McLean, VA.
Preliminary Energy Sector Assessments of Jamaica. Volume III: Renewable Energy. Part I: Solar Energy - Commercial and Industrial.
Jan 80, 102p ESI/EA-80-0101-3A, AID-PN-AAJ-424
Contract AID-532-79-11
See also Volume 2, PB82-249525 and Volume 3, Part 2, PB82-249541.
Also available in set of 8 reports PC E99, PB82-249509.

Keywords: *Solar water heating, *Energy, *Jamaica, Assessments, Developing countries, *Solar energy, Solar heating, Developing country application, Renewable energy sources, *Solar cooling systems, Industrial sector, Commercial sector.

This study concerns commercial and industrial solar applications, specifically solar water heating and solar air cooling. The study finds that solar domestic water heating and boiler make-up water preheating are technically feasible and, depending on the displaced energy source (electrical or various fuel types), economically justified; and that solar hot water installations could displace the equivalent of 189,842 barrels of fuel oil per year. However, solar cooling requires high performance collectors not currently manufactured in Jamaica, and feasibility studies indicate that solar cooling in the near term is not economically justified.

PB82-249541/GAA PC **A04**/MF **A01**
Energy Systems International, McLean, VA.
Preliminary Energy Sector Assessments of Jamaica. Volume III: Renewable Energy. Part II: Solar Energy - Agricultural.
Jan 80, 73p ESI/EA-80-0101-3B, AID-PN-AAJ-425
Contract AID/532-79-11
See also Volume 3, Part 1, PB82-249533 and Volume 3, Part 3, PB82-249558.
Also available in set of 8 reports PC E99, PB82-249509.

Keywords: *Solar energy, *Solar drying, *Renewable energy, *Energy, *Jamaica, Assessments, Developing countries, Solar energy, Drying, Agricultural products, Solar dryers, Developing country application, Renewable energy sources.

The study is concerned with the use of solar heat for drying agricultural products (crops, timber, and fish). The study finds that Jamaica has an ideal climate for solar agricultural product drying with the following methods offering the greatest promise; sun drying using open barbeques; drying in transparent buildings (with or without attached collectors) for small operations; new drying systems using solar air heaters with forced air drying; preheating air for existing commercial fossil-fueled dryers; and fish drying via chemical dehydration with solar regeneration of the chemical. The primary needs are to develop and construct environmentally suitable solar dryers and to train engineers in solar system design and installation.

PB82-249558/GAA PC **A05**/MF **A01**
Energy Systems International, McLean, VA.
Preliminary Energy Sector Assessments of Jamaica. Volume III: Renewable Energy. Part III: Biogas Applications.
Jan 80, 85p ESI/EA-80-0101-3C, AID-PN-AAJ-426
Contract AID-532-79-11
See also Volume 3, Part 2, PB82-249541 and Volume 3, Part 4, PB82-249566.
Also available in set of 8 reports PC E99, PB82-249509.

Keywords: *Energy, *Jamaica, Assessments, Developing countries, Developing country application, *Bioconversion, Anaerobic digestion, Synthetic fuels, Renewable energy sources.

The study considers the feasibility of biogas generation and applications. Biogas is a high grade fuel produced by anaerobic digestion of organic matter such as farm crops or animal manure and is useful for cooking and other purposes.

PB82-249566/GAA PC **A04**/MF **A01**
Energy Systems International, McLean, VA.
Preliminary Energy Sector Assessments of Jamaica. Volume III: Renewable Energy. Part IV: Energy Conversion from Waste.
Jan 80, 62p ESI/EA-80-0101-3D, AID-PN-AAJ-427
Contract AID-532-79-11
See also Volume 3, Part 3, PB82-249558 and Volume 4, PB82-249574.
Also available in set of 8 reports PC E99, PB82-249509.

Keywords: *Energy, *Jamaica, Assessments, Developing countries, Wastes, Waste recycling, Developing country application, Renewable energy sources.

The study considers the feasibility of energy conversion from wastes. Specifically, the study analyzes the potential for energy recovery from urban wastes in Jamaica, with the Kingston area serving as a case study, and assesses the feasibility of building a prototype demonstration unit for energy recovery from solid wastes at the University of the West Indies (UWI)-Mona Campus. Steam-generating waterwall combustion, refuse-derived fuel systems, pyrolysis, anaerobic biological conversion (biogas), and gas recovery from landfills are discussed as alternative systems for energy recovery from urban wastes.

PB82-249574/GAA PC **A06**/MF **A01**
Energy Systems International, McLean, VA.
Preliminary Energy Sector Assessments of Jamaica. Volume IV: Coal Prefeasibility Study.
Jan 80, 118p ESI/EA-80-0101-4, AID-PN-AAJ-428
Contract AID-532-79-11
See also Volume 3, Part 4, PB82-249566 and Volume 5, PB82-249582.
Also available in set of 8 reports PC E99, PB82-249509.

Keywords: *Energy, *Jamaica, Assessments, *Electric power, Developing countries, Coal, Feasibility, Electric power generation, Substitutes, Fuels, Developing country application.

The study assesses the technical, economic, and environmental feasibility of diversification from oil to coal for generating electric power for the Jamaican Public Service Company (JPS) and the bauxite/alumina industry.

PB82-249582/GAA PC **A07**/MF **A01**
Energy Systems International, McLean, VA.
Preliminary Energy Sector Assessments of Jamaica. Volume V: Electric Utility Rate Analysis.
Jan 80, 136p ESI/EA-80-0101-5, AID-PN-AAJ-429
Contract AID-532-79-11
See also Volume 4, PB82-249582.
Also available in set of 8 reports PC E99, PB82-249509.

Keywords: *Electric power, *Energy, *Jamaica, Assessments, Electric utilities, Rates(Costs), Developing countries, Developing country application.

The study analyzes the electric utility rate structure of the Jamaica Public Service Company (JPS) in order to determine whether it promotes economically efficient use of electricity, is based on principles of equity and fairness, and provides JPS with sufficient resources to maintain acceptable service quality. Current tariffs are described, and features such as declining block tariffs (decreasing unit price with increasing volume used), expander clauses (decreasing rate if total energy use increases without increasing maximum power demand), and ratchet clauses (little or no reduction in charges if use falls below a previously set high), which may not encourage conservation or efficient system usage, are noted. Various tariff options, based on marginal cost pricing principles (tying prices to the additional cost of supplying the electricity), are presented for each rate category in the JPS system (residential, small commercial, industrial, and large commercial). Flat rate (with and without demand charges), time of use pricing, fuel adjustment, and cost of service adjustment are considered.

PB82-249749/GAA PC **A03**/MF **A01**
National Research Council, Washington, DC.
Nutritional Surveillance: A Synopsis.
Final rept.
1982, 31p
Contract AID/ta-C-1428

Keywords: *Nutrition, Policies, Project management, Food consumption, Statistical analysis, Decision making, Nutritional deficiencies, Nutritional requirements, Planning, Poverty groups.

Nutritional surveillance is defined as watching over nutritional status in order to make decisions on policies and programs that are aimed at improving the nutrition of poor populations. Data must be collected regularly and be readily interpretable for policy and program planners, and the agencies involved must be closely linked to the mechanisms of planning and intervention. Surveillance serves three general purposes (1) monitoring changes in indicators for purposes of planning to improve nutrition, (2) evaluating nutritional effects of programs and (3) providing early warning and intervention to prevent epidemic inadequacies in food consumption. Based on experience since 1975, the most promising approaches in nutritional surveillance involve the use of existing resources for data collection. Those countries with the lowest incomes and minimal development of statistical services will generally have to use data available from routine services; those with more developed institutional data collection and analysis capacities can include surveys.

PB82-249756/GAA PC **A03**/MF **A01**
National Research Council, Washington, DC.
Nutritional Components of a Primary Health Care Delivery System.
Final rept.
1982, 49p
Contract AID/ta-C-1428

Keywords: *Nutrition, *Food, *Health care delivery, Food consumption, Communities, Rural areas, Public health, Health care, Delivery of health care, Agency for International Development.

This report focuses on the nutrition component of an integrated health care system. Such a system should be based on expressed concern and active participation of the community, the identification of prevalent health and nutrition problems, and an approach to their solution through appropriate technology applied by community workers and traditional practitioners. The report outlines a strategy for introducing a nutrition component, training of primary health care workers, evidence of success of primary health care programs with a nutrition component and research needed to improve the performance of primary health care workers in promoting nutrition at the local level. Minimum responsibilities in the area of nutrition relate mainly to improved food consumption and utilization.

PB82-249798/GAA PC **E03**/MF **E03**
Cement and Concrete Association, Slough (England).
Further Work on the Behaviour of Reinforced Concrete Blockwork Subject to Lateral Loading.
Technical rept.,
J. J. Roberts. c1980, 46p TR-531, ISBN-0-7210-1181-0
Also pub. in ISSN-0528-3701.

Keywords: *Concrete, *Reinforced concrete, Loads(Forces), Walls, Compressive strength, Cracks, Deflection.

The results of tests on the behavior of vertically reinforced concrete blockwork subject to lateral loading were reported in Technical Report 42.506. These results have since been supplemented by tests on ten horizontally reinforced wall elements and eight vertically reinforced sections. The later results support the conclusion of the earlier report that the present design recommendations for reinforced concrete blockwork are conservative and uneconomic. The purpose of the tests described in the present report was to extend the range of tests on vertically reinforced walls previously reported, provide information on horizontally reinforced walls, and give some guidance on anchorage bond stresses and modifications to infill mix design.

PB82-250705/GAA PC **A03**/MF **A01**
Oklahoma State Univ., Stillwater. Dept. of Agricultural Economics.
Production Loans to Groups of Farms: Experiments in Honduras,
Loren Parks, and Ronald Tinnermeier. Aug 80, 40p IDS-80-5, AID-PN-AAJ-251
Contract AID/ta-CA-1

Keywords: *Honduras, *Banking, *Farming, Developing countries, Banking business, Agreements, Requirements, Recommendations, Credit, Production, Project management, Agricultural engineering, Developing country application.

The report details the experience of the Banco Nacional de Desarrollo Agricola (BANADESA) of Honduras in extending credit to two types of groups--agricultural committees (AC), composed of independent farmers living in one town; and informal groups of small farmers organized solely to obtain loan credit. From the BANADESA experience, five conclusions are drawn: (1) The complexity of borrower group dynamics requires that much attention be given to identifying group functions and to forming groups. Groups, which ideally should consist of 10-20 members, are less stable if organized solely to obtain credit. (2) Group lending does not always reduce loan forms, requirements, collateral, etc. Some loan requirements are set by law or are deeply ingrained in the institution itself. (3) Joint liability, while essential, is not easily accepted by farmers or easily implemented by credit institutions. Farmers are reluctant to cover another's debt and good borrowers may be disqualified because their group defaulted. (4) Factors outside the group's control may cause serious group delinquency problems. (5) Farm record keeping is more readily accepted by groups receiving cash credit. It is concluded that group lending, while not a panacea for small farm development, holds promise if existing problems can be eliminated.

PB82-251190/GAA PC **A02**/MF **A01**
North Carolina Univ. at Chapel Hill.
1979 Mexico National Fertility and Mortality Survey: A Summary of Results.
Summary Series no. 2.
Dec 80, 24p AID-PN-AAJ-384
Contract AID/DSPE-C-0025

Keywords: *Fertility, *Health, *Demography, *Mexico, Developing countries, Surveys, Statistical data, Developing country application, Family planning.

In 1977 Mexico established a national family planning plan aimed at reducing the country's 3.2% annual population growth rate to 2.5% by 1982 and to 1.0% by 2000. This report summarizes the findings of a 1979 National Fertility and Mortality Survey indicating progress towards these goals. The survey was multipurpose and used a two-part questionnaire: one part seeking basic demographic data from 18,505 representative households; the other collecting information on fertility, infant mortality, and related matters from 20,482 women aged 15-49 years in those same households. The survey showed that, despite evidence of a slight tendency towards aging in comparison with 1970 and 1976 data, Mexico's population is still relatively young, with 45.3% under age 15 and only 3.9% aged 65 and over.

PB82-251208/GAA PC **A09**/MF **A01**
Harza Engineering Co., Chicago, IL.
Environmental Design Considerations for Rural Development Projects.
Oct 80, 192p AID-PN-AAJ-322
Contract AID/SOD/PDC-C-0249

Keywords: *Rural areas, *Environmental surveys, Guidelines, Developing countries, Environment, Communities, Project planning, Coordination, Ecology, Irrigation, Sanitation, Roads, Health, Water quality, Electric utilities, Developing country application, Villages.

This manual, intended for use by A.I.D. field officers, development consultants, and host-country planners, presents guidelines for identifying potentially desirable and undesirable environmental effects that may accompany small rural projects (with some attention given to situations in larger villages and periurban areas) and applies these guidelines to specific types of rural projects. Rural communities are generally small and self-sufficient, making it especially important to consider, at the design stage, a project's impact on all members of the community and the need to remove obstacles so that villagers can advance themselves without becoming unduly dependent on others. Environmental effects may be expected in several areas including human health, air and water quality, pesticide contamination, and endangered species. Five specific types of rural projects are discussed in detail: roads, electrification, water supply and sanitation, irrigation and on-farm water management, and small-scale industry. Project description, environmental considerations, mitigation and enhancement measures, operational evaluation and monitoring, and planning information required are discussed for each project type.

PB82-251398/GAA PC **A06**/MF **A01**
Oklahoma State Univ., Stillwater. Dept. of Agricultural Economics.
Managing Small Farmer Credit Programs: A Case Study in Honduras,
Laren L. Parks, and Harry P. Mapp, Jr. Aug 80, 102p IDS-80-4, AID-PN-AAJ-252
Contract AID/ta-CA-1

Keywords: *Farming, *Banking, Banking business, Developing countries, Credit, Records management, Policies, Project management, Agricultural engineering, *Honduras, Developing country application, Case studies, Procedures.

The rising cost of agricultural and farmers' limited funds make successful credit extension services essential to small farm ownership and operation in the developing world. This study, part of A.I.D.'s Small Farmer Credit Project, details an effort to improve the credit management and lending practices of the National Agricultural Development Bank of Honduras. The information collecting and processing component involved several activities. Loan files were investigated to determine the relation of the Bank's use of enterprise budgets to loan authorization, cash disbursement, and loan default. Farm records were analyzed for information on prices, resources, profitability, cash flow, and other variables. Next, a recordkeeping system was developed, tested, and modified in Jutiapa, Las Playitas, Ajuterique, and El Matazano. Simple, accurate crop and livestock enterprise budgets and a system for collecting input and product prices were then instituted in the 13 Bank regions. The loan administration and evaluation component involved many policy and procedural changes.

PB82-251414/GAA PC **A06**/MF **A01**
Nebraska Univ.-Lincoln. Inst. of Agriculture and Natural Resources.
Genetic Improvement of Productivity and Nutritional Quality of Wheat.
Final rept. 1 Jul 66-31 Dec 79,
V. A. Johnson, and P. J. Mattern. Dec 80, 115p AID-PN-AAJ-327
Contract AID/ta-C-1093, Contract AID/csd-1208
See also PB-279 445.

Keywords: *Wheat, Breeding, Proteins, Metabolism, Lysine, Photosynthesis, Nitrogen fixation, Plant physiology, Laboratory animals, Rats, Bioassay, Yield, Quality, Tables(Data), Field tests, Developing country application, Winter wheat plants, Spring wheat plants.

Food to nourish the world's population, which will reach 6.5 billion by the year 2000, transcends all other problems confronting countries and governments. To help increase world food production, A.I.D. funded a research project to genetically engineer high protein wheat (HPW) at the University of Nebraska from 1966 to 1979. This final report summarizes the project's research findings. Analyses of 20,000 wheat cultivars showed that genetic variation for HPW of at least 5% exists in hexaploid wheat; genetic variation for lysine (LYS) amounts to only 0.5% LYS, as a percent of HPW, correlates negatively with HPW at protein levels up to 15%; and a strong positive correlation exists between LYS per unit weight and grain protein content. Major genes affecting grain HPW content were identified in Atlas 66 and Nap Hal. Genes modestly affecting LYS were found in CI13449 and Nap Hal. Hybridized genes were transferred to productive short-statured winter and spring wheats.

PB82-251422/GAA PC **A11**/MF **A01**
PADCO, Inc., Washington, DC.
Transition Housing for Victims of Disasters. Volume I: Disaster Assistance Manual.
Apr 81, 235p AID-PN-AAJ-399
Contract AID/OTR-C-1829

Keywords: *Disasters, *Housing, Assessments, *Project planning, Project management, Site surveys, Quality control, Developing countries, Earthquake resistant structures, Developing country application, Disaster relief, Low income housing, Land ownership.

Following a disaster, A.I.D. often provides housing both to meet victims' immediate shelter needs and to create a base from which to reconstruct permanent housing. This manual for A.I.D. and host country disaster assistance and housing officials focuses on expeditious planning and implementation of conventional, contractor-built, low-and middle-income, transitional housing. Emphasis is placed on A.I.D.'s potential contribution and lessons learned from past experience in the following areas: (1) disaster assessment; (2) operational responsibility; (3) project beneficiaries; (4) project timing; (5) environmental considerations; (6) land ownership and financing; (7) site selection, location, layout, and access; (8) phased occupancy and implementation of infrastructure; (9) safe housing program components; (10) cyclone-, flood-, and earthquake-resistant design; and (11) project management and evaluation.

PB82-251505/GAA PC **A02**/MF **A01**
Veterans Administration, Washington, DC.
Management of Vivax Malaria in the Veteran,
Technical bulletin,
Harry Most. Nov 53, 11p VA/TB-10-93

Keywords: *Malaria, *Diseases, Therapy, Diagnosis, Chemotherapy.

Significant advances in the chemotherapy of malaria since the August 1948 technical bulletin on the same subject are reported. Treatment of vivax malaria during the Korean War was relatively simple because of new drugs such as chloroquine, primaquine, and 8-aminoquinoline drugs. Clinical aspects of vivax malaria are described to aid in diagnosis, including abdominal symptoms, chronic and central nervous system manifestations, as well as miscellaneous problems. Laboratory diagnosis by demonstration of the parasite in the peripheral blood before treatment is emphasized. Symptomatic and chemotherapeutic treatments are described. Chloroquine is recommended for the routine treatment of acute attacks of vivax malaria, although the infection would not be cured. Concurrent treatment with primaquine was found to cure ninety-five percent of Korean vivax malaria, although the problem of hemolysis in black people necessitated careful monitoring. The discovery of the drug daraprim seemed to promise hope of a definitive cure for vivax malaria, but more research was needed to determine its ultimate role.

PB82-251547/GAA PC **A03**/MF **A01**
Bureau of Industrial Economics, Washington, DC.
Confectionery Manufacturers Sales and Distribution 1979,
Renee L. Gallop, Diane Wilson, and Jean A. Carter. Dec 80, 33p
Errata sheet inserted.

Keywords: *Industrial development, Manufacturers, Food consumption, International trade, Prices, Sugars, Distribution systems.

This 53rd annual report on Confectionery Manufacturers' Sales and Distribution presents detailed data on the volume and value of sales, ingredient use, and foreign trade as well as analysis of significant industry developments.

PB82-252735/GAA PC **A04**/MF **A01**
Indian Agricultural Research Inst., New Delhi.
Indian Agriculture Research Institute. Division of Soil Science and Agricultural Chemistry: Activities and Achievements.
1982, 57p

Keywords: *Agriculture, *Soils, *Fertilizers, *Manures, *India, Laboratories, Clay minerals, Geomorphology, Farm crops, Nutrients, Phosphorus, Methane, Anaerobic processes, Digestion(Biology), Leguminous plants, Soil fertility, Developing country application, Biogas process.

One of the most important contributions of IARI scientists during the last 75 years has been in generating the basic information which the country today has on its soil, and its structure and fertility. This report contains the major research activities and achievements of the Division. The main objectives of this Division is to carry out research work on the fundamental and applied aspects of the physical, chemical, minerological, and biological properties of soils, fertilizers, and manures, and their interaction with soil and plant for improvement and maintenance of soil fertility.

PB82-252750/GAA PC **A07**/MF **A01**
National Dairy Research Inst., Karnal (India).
Janata Biogas Technology and Fodder Production,
S. Neelakantan. 1981, 139p
Sponsored in part by Ministry of Agriculture, New Delhi (India).

Keywords: *Manures, *Biomass, *Fuels, *Fertilizers, Technology, Industrial plants, Performance evaluation, Utilization, Solid wastes, Developing country application.

An effective bio-gas program leads to efficient use of cow dung for gas recovery and partial supplement to plant nutrient requirements. Bio-gas program leads to improvement in rural living including rural sanitation. The Janata biogas plant designed by the State Planning Institute, Lucknow, based on biogas technology, has proved to be efficient and economical. This book contains the various papers presented at the seminar held to review this technology. The various topics covered are: Status of Biogas Program in India; Role of Extension Agencies in Developing Program of Energy Utilization; Introduction to Drumless Biogas Plant; Principles and Application of Anaerobic Fermentation and Biogas Production, Operational System of Gobar Gas in Rural India; Complete Recycling of Cattle Shed Wastes through Biogas Plant; Chemical Composition of Cattle Excreta and Its Manurial Value; Profitability of Biogas Plant; Biogas Production from Various Organic Wastes; Performance of Janata Biogas Plant and Biogas Utilization in Appliances; Utilization of Solar Energy for Domestic Purposes; and Conservation of Forages. Plant requirements and cost estimates have been given for several units.

PB82-253048/GAA PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Vehicle Operating Costs in the Caribbean: An Experimental Study of Vehicle Performance.
G. Morosiuk, and S. W. Abaynayaka. c1982, 29p
TRRL/LR-1056
Also pub. in ISSN-0305-1293.

Keywords: *Transportation, *Motor vehicles, Fuel consumption, Saint Lucia Island, Caribbean Islands, Roads, Comparison, Kenya, Developing countries, Speed.

This report describes an experimental study of vehicle speed and fuel consumption undertaken in the Eastern Caribbean island of St Lucia. The study was designed to extend the range of the empirical relationships derived in an earlier study in Kenya which relate vehicle speed and fuel consumption to the geometric characteristics and surface condition of the road. The results of this study are compared with the relationships derived in the Kenya study and recommendations are made on the use of the two sets of relationships. A methodology has been evolved to provide vehicle speed estimating relationships which are applicable to physical and environmental conditions lying between the two sets of conditions encountered in Kenya and St Lucia.

PB82-253428/GAA PC **A23**/MF **A01**
Office of Technology Assessment, Washington, DC.
World Population and Fertility Planning Technologies: The Next 20 Years. Volume II: Working Papers.
Jun 82, 542p*
See also PB82-253436 through PB82-253477 and PB82-200338.

Keywords: *Fertility, *Birth control, *Contraceptives, Developing countries, Technology innovation, Research projects, *Family planning.

This volume contains working papers written for OTA in preparation of the report World Population and Fertility Planning Technologies: The Next 20 Years. The contents include: (1) Prospects for new or improved birth control technologies by the year 2000 A.D.; (2) Factors influencing the demand for children and their relationship to contraceptive use; (3) Factors that determine the Appropriateness of new technologies to consumer needs; (4) Future prospects for the development of birth planning technology: What the experts think; (5) The impacts of population growth on less developed countries.

PB82-253683/GAA PC **A03**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
Consortium on Trade Research: Agricultural Import Demand in Low-Income, Middle-Income, and Centrally Planned Countries.
Foreign agricultural economic rept.,
T. Kelley White, George E. Rossmiller, and Vernon Sorenson. Aug 82, 41p FAER-173
See also PB81-129983.

Keywords: *International trade, *Agriculture, Government policies, Developing countries, Imports, Exports, Food consumption, Demand(Economics), USSR, China, Communist countries.

During the seventies, demand for agricultural imports increased substantially in low- and middle-income countries and the centrally planned countries. Further growth in such demand will depend on internal policy decisions and domestic and international economic conditions of these countries. State trading, food reserves, and bilateral agreements are becoming increasingly important in international agricultural trade. The third meeting of the Consortium on Trade Research focused on agricultural import demand in the developing and centrally planned countries and the policies and economic conditions affecting that demand.

PB82-253907/GAA PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Vehicle Operating Costs in the Caribbean: Results of a Survey of Vehicle Operators,
H. Hide. c1982, 35p TRRL-LR-1031
Also pub. in ISSN-0305-1293.

Keywords: *Caribbean, *Transportation, *Motor vehicles, Operating costs, Caribbean Islands, Roads, Surveys, Kenya, Pavements, Surfaces, Comparison, Developing countries.

This report describes an investigation into factors affecting vehicle operating costs in the Eastern Caribbean. The study was designed to check the validity of the vehicle operating cost relationships derived from an earlier study in Kenya and to extend these relationships to include the effects of road geometry and poor bituminous surfaces. Data were collected over a two year period by means of a user survey and the effect of various road and vehicle parameters on the components of vehicle operating cost was examined. The results of the analysis are presented and are compared with the results obtained from the Kenya study to show the different effects of poor quality paved and unpaved roads on the cost of operating vehicles. The results of both studies are combined to produce a set of relationships for both paved and unpaved surfaces. (Copyright (c) Crown Copyright 1982.)

PB82-254426/GAA PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Characteristics of Public Transport Demand in Indian Cities.
Final rept. 1978-80,
D. A. C. Maunder, P. R. Fouracre, M. G. Pathak, and
C. H. Rao. c1982, 29p TRRL/SR-709, TRRL-
SUPPLEMENTARY-709
Also pub. in ISSN-0305-1315.

Keywords: *Transportation, Urban areas, Surveys, Travel patterns, Socioeconomic status, Urban sociology, Developing countries, *India, Public transportation.

Surveys were made in a number of Indian cities on the demand for public transport services. The purpose of the project was to investigate the effectiveness of urban public transport and to relate travel patterns to the socioeconomic characteristics of the passengers. Surveys took the form of passenger interviews.

PB82-254475/GAA PC **E03**/MF **E03**
Commission of the European Communities, Luxembourg.
Development of a Straw-Burning Furnace, to Be Used Initially in Conjunction with a Crop Drying Plant.
Final rept.,
B. Wilton. c1981, 37p EUR-7562-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Keywords: *Agricultural machinery, *Crops, *Drying, Fuels, Straw, Heat exhangers, Comustion products, Drying apparatus.

The concept of whole crop harvesting of grain consists in separating the crop in the field and burning parts of the straw to dry the separated grain. The present work is concerned with the development of a furnace/heat exchanger unit capable of burning the straw. Flue gases from the furnace pass through a multi-pass water-filled heat exchanger and are blown through a simple conveyor drier for the straw which may be as wet as 50% moisture content. The heated water is pumped to a second heat exchanger where it gives up heat to air, blown over finned pipes and used in a batch or continuous grain drier. The highest overall efficiency obtained was 55.6% at an output of 139kW.

PB82-254889/GAA PC **A05**/MF **A01**
Oklahoma Water Resources Research Inst., Stillwater.
Appropriate Selection of Water/Wastewater Treatment Processes for Small Cities and Rural Areas,
George W. Reid, Andy Law, and Tanwir Chaudhry.
Mar 82, 87p* W82-06162, , OWRT-A-100-OKLA(1)
Contract DI-14-34-0001-1138
Prepared in cooperation with Oklahoma Univ., Norman. Bureau of Water and Environmental Resources Research.

Keywords: *Water treatment, *Industrial wastes, *Waste water, *Rural areas, *Water pollution, Substitutes, Technology, Water quality.

Small communities often have to resort to usage of highly inappropriate and sophisticated systems that are difficult to operate and maintain with regard to their water supply and sanitation needs. A computer application model is presented that will aid engineers/planners in determining a community's needs and resources. Two versions of this model were developed: one, for use on a low-cost microcomputer; the other, for use with a hand-held calculator. Both of these versions consider the socio-technological level of the community, as well as indigenous information covering water quality and demographic data. Four communities in the rural and urban fringe in Oklahoma were selected for testing the validity of this model. The model identifies water and waste treatment alternatives which are compatible with local available resources and manpower capabilities; application of appropriate technology substantially enhances the ability of the community to satisfy its water and wastewater treatment objectives. Community information was obtained from the use of two survey questionnaires to assist identification of appropriate technology for water/wastewater treatment.

PB82-255381/GAA PC **A06**/MF **A01**
National Food Processors Association, Berkeley, CA.
Tomato Cleaning and Water Recycle.
Final rept. Jul 74-Mar 77,
Walter W. Rose. Apr 82, 106p EPA-600/2-82-059
Grant EPA-S-803251

Keywords: *Tomatoes, *Waste water reuse, Design, Soils, Vacuum filtration, Concentrators, Dewatering, Cleaners, Mechanical guides, Mud, Tanks(Containers), Cost analysis, Flow charting, Circulation, Flocculating, Effectiveness.

A full-scale dump tank water recycle system was developed and demonstrated. A false bottom-ejector transport system removed soil from the water. Clarified water was either recycled back to the dump tank or discharged to the sewer. A vacuum belt was developed for dewatering the mud prior to final disposal. Two types of rubber disc machines were evaluated for the cleaning of tomatoes. Both were found to be effective in cleaning the tomato surfaces using minimal amounts of water.

PB82-255498/GAA PC **A05**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Paraprofessionals in Village-Level Development in Sri Lanka: The Sarvodaya Shramadana Movement,
Cynthia Moore. 1981, 78p PP-4, AID-PN-AAJ-635
Contract AID/ta-BMA-8

Keywords: Developing countries, *Education, *Training, Sri Lanka, Developing country application, *Social services, Training programs.

Despite increasing worldwide interest in the use of paraprofessionals as frontline workers to provide services to the rural poor, knowledge needed to plan and conduct paraprofessional programs remains scant. To remedy this lack, model programs in six countries were studied. This report, the fourth of the series, details Sri Lanka's Sarvodaya Shramadana Movement (SSM), a private voluntary organization that began in 1958 and has since gained national status (involving 2,500 villages) and international acclaim for its holistic development approach.

PB82-256058/GAA PC **A02**/MF **A01**
Southeastern Forest Experiment Station, Asheville, NC.
Changes in Soil Fertility Following Prescribed Burning on Coastal Plain Pine Sites.
Forest Service research paper,
William H. McKee, Jr. Jun 82, 25p SEFES-82-7,
FSRP-SE-234

Keywords: *Soils, *Forestry, Phosphorus, Soil horizons, Nitrogen, Summer, Calcium, Nutrients, Texture, Humus.

Soil and forest floor samples were collected from four prescribed burning studies in the Atlantic and Gulf Coastal Plains. The surface textures of soils ranged from sands to silt loams and the drainage classes from well to poorly drained. Burning treatments had been in force from 8 to 65 years. Reduction of the forest floor and its chemical constituents was related to frequency of burning; however, a protective organic horizon remained on all soils. Burning was found to have had no deleterious effect on organic matter or nitrogen in surface mineral soil. A comparison of earlier results with present findings suggests that annual winter burning may increase nitrogen in surface mineral soil while annual summer burning appears to reduce the total nitrogen content. Prescribed burning consistently increased the amount of available phosphorus. Fractionation of soil phosphorus indicated that burning resulted in the deposition of no specific form of phosphorus but accelerated the mineralization of cycling of the nutrient.

PB82-256835/GAA PC **A04**/MF **A01**
Brown and Caldwell, Walnut Creek, CA.
Application of Ozone to Eliminate Tertiary Treatment of Wastewater Used for Industrial Cooling.
Final technical rept.,
Douglas T. Merrill, and Denny S. Parker. Feb 82, 61p
W82-06709, , OWRT-C-90070-R(9413)(1)
Contract DI-14-34-0001-9413

Keywords: *Industrial wastes, Recirculation, Corrosion prevention, Fouling prevention, Scale(Corrosion), Pilot plants, Design criteria, Performance evaluation, Economics, Feasibility, Water pollution, *Waste water reuse.

Study was undertaken to determine whether the beneficial performance of ozone (biofouling, corrosion, and chemical scaling control), when used as the sole source of cooling water treatment for air-conditioning systems, could be obtained at higher cooling water temperatures typical of industrial cooling with secondary municipal effluent (SME) used as the cooling medium. A pilot cooling system was constructed, and a 6-month experimental study initiated to determine process limits, mechanisms of scaling inhibition by ozone, and to evaluate factors influencing technical/economic feasibility. It was found that, while ozone use adequately controlled corrosion and biofouling, chemical scaling could not be prevented at conditions necessary for significant economic justification. Calculations indicate that the makeup waters (SME) used will become saturated with respect to calcium phosphate at less than 2 cycles of concentration; hence, a scaling potential exists at conditions less stringent than those used in the present study. It is recommended that ozone for scaling elimination in recirculating industrial cooling systems be dropped from further consideration where the makeup water is SME.

PB82-257809/GAA PC **A04**/MF **A01**
Wisconsin Univ.-Madison.
Decentralization for Development: The Form and Substance of International Development Strategies.
Occasional paper,
Thomas E. Morgan. Apr 81, 53p OP-3, AID-PN-AAJ-518
Contract AID-DSAN-C-0060

Keywords: *Regional planning, *Management planning, *Management techniques, Management, Strategies, Development, Government, Participation, Low income groups, Organization theory, Developing country application, Administration.

Dispelling the ambiguities surrounding the current theory and practice of decentralization, widely touted as the key to development strategy, this study develops a clearer and more appropriate view of decentralization. In the author's view, most development strategies calling for political or administrative decentralization derive from the latter causes: decentralization and its corollary, popular participation, are deemed necessary to reverse the rigid social and governmental structures that exploit the poor. Actually, however, the substance of these strategies belies their rhetoric; for in practice they deny local entities real power and promote participation to reinforce rather than to reform existing central power structures.

PB82-258666/GAA PC **A11**/MF **A01**
Creative Associates, Inc., Washington, DC.
AID Assistance to Education: A Retrospective Study,
Francis J. Method, and Saundria Kay Shaw. Feb 81, 234p AID-PN-AAJ-460
Contract AID/DSPE-C-0075

Keywords: *Education, *Training, *Financial Management, Financing, *Rural areas, Females, Low income groups, Specialized training, Instructors, Developing country application.

The report is an analysis of the character, magnitude, and distribution of AID's education programming over the past 20 years, with emphasis on the period after 1970. The purpose is to inform AID decision makers and to strengthen the agency's ability to respond accurately to inquiries from Congress, researchers, and other interested parties. This study presents a significantly different picture of AID's education assistance from that of previous agency studies, which were drawn only from official accounting and classification systems. The study, using a classification system especially developed for this project, defines educational activities broadly to include support for education, training, and human resources development in all sectors. For example, agricultural universities and American Schools Abroad are included, although neither category is in the agency's education sector. The study also covers support provided through accounts for local currency, security/supporting assistance, development loans, and other special appropriations.

PB82-258674/GAA PC **A03**/MF **A01**
Puerto Rico Administration of Regulations and Permits, Santurce.
Facilidades para los Fisicamente impedidos: Reglamentos y Illustraciones (Facilities for the Physically Handicapped: Regulations and Illustrations).
Jan 79, 48p
Text in Spanish.

Keywords: *Buildings, *Health, *Puerto Rico, Barriers, Handicapped persons, Availability, Developing country application, Architectural barriers.

The document contains the approved amendments of building regulations (Planning Regulations No 7). The amendments, which add a seventh section to the aforementioned regulations, are intended to establish a series of special requirements for making new structures accessible to the physically handicapped. The amendments explain their scope and interpretation and concern accessibility to buildings, sanitary facilities, observation areas at assembly and entertainment sites, and other facilities such as kitchens, bathrooms, water fountains, telephones, switches, controls, doorways, passageways, handles, parking areas, ramps, elevators, stairs, work areas, all of which are illustrated with detailed drawings and dimensions.

PB82-259003/GAA PC **A14**/MF **A01**
Centre Technique des Industries Mecaniques, Saint-Etienne (France).
Evaluation of Lubricants for Air Compressors.
Final rept.,
N. Allier, and J. G. Schamelhout. Aug 82, 315p
CETIM-12-E-12-0
Trans. of mono. Des Lubricants pour Compresseurs d'Air, Sep 79. See also N82-10408/4.

Keywords: *Lubrication, Evaluation, Synthetic oils, Translations.

The document provides the results of a detailed study of methods for evaluating both mineral and synthetic lubricants for use with reciprocating and rotary air compressors. The main concern with respect to reciprocating air compressors is that the lubricants should be adequately evaluated from the points of view of safety toward man and the environment, and safety toward the equipment. For injection-cooled rotary air compressors, emphasis is on longivity of service and performance in the presence of air. In addition to describing the studies and their results, the document discusses the basics of lubrication and its application to air compressors; the formation of carbon deposits and the rise of fire in reciprocating compressors; standards relating to lubricants for air compressors; assessment of air compressors available in the world market; assessment concerning lubricants recommended by manufacturers and by the International Standards Organization; existing evaluation methods; defects observed in air compressors.

PB82-259383/GAA PC **A05**/MF **A01**
Agency for International Development, Washington, DC.
Energy in Irrigation in Developing Countries: An Analysis of Energy Factors to Be Included in a National Food Policy,
Ernest T. Smerdon, and Edward A. Hiler. Dec 80, 84p AID-PN-AAJ-628

Keywords: *Energy, *Irrigation, *Ground water, Cost analysis, Pumping, Sprinkler irrigation, Biomass, Fuels, Water loss, Solar energy, Developing country application, Wind power.

In response to the challenge posed by escalating increases in the amount of energy needed for irrigation in developing countries, this report analyzes current energy consumption in irrigation, renewable energy technologies, and relevant food policy issues facing developing country governments. The authors find that developing groundwater supplies entails twice the energy costs of developing surface water supplies, and that the latter can be more efficiently manufactured, installed, and operated in developing countries.

PB82-259391/GAA PC **A08**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Paraprofessionals in Rural Development,
Milton J. Esman, Royal Colle, Norman Uphoff, and Ellen Taylor. 1980, 159p PP-1, AID-PN-AAJ-637
Contract AID/ta-BMA-8

Keywords: *Rural areas, *Social services, *Training, Manpower, Developing countries, Bolivia, Sri Lanka, Philippines, Guatemala, Senegal, Upper Volta, Developing country applications, Human resources.

The reluctance of developing country professionals to work in remote rural areas and the prohibitive cost of delivering the social services so sorely needed there attests to the need for effective paraprofessionals (PP's) as agents of rural development. This report, based upon a study of PP programs in six nations, describes the role of PP's in rural development, as well as the factors which spell success or failure for development efforts employing such personnel.

PB82-259417/GAA PC **A06**/MF **A01**
Agency for International Development, Washington, DC.
Government Sponsored Agricultural Intensification Schemes in the Sahel: Development for Whom,
Abraham S. Waldstein. Aug 78, 117p AID-PN-AAH-569

Keywords: *Agriculture, *Sahel, *Irrigation, *Economic development, Social effect, Technical assistance, Decision making, Diets, Cattle, West Africa, Developing country application, Sahel Region(Africa), Ownership.

The question, 'Development for Whom', is fundamental to the evaluation of development assistance programs. This paper specifically considers the extent of benefits accruing to the rural poor from large-scale agricultural/irrigation projects in the Sahel. A common characteristic of these efforts has been the subjugation of the overall welfare of farmers to institutional or national interests, removal of farmers from their native lands, and/or reliance on migrant workers. Another drawback has been the exclusion of the farmers from all decisionmaking processes. In many instances the farmers were forced as tenants to cede their own individual economic interests to the interests of the overall project.

PB82-259441/GAA PC **A02**/MF **A01**
Maxwell School of Citizenship and Public Affairs, Syracuse, NY.
Balanced Urbanization, Spatial Integration, and Economic Development in Asia: Implications for Policy and Planning,
Dennis A. Rondinelli. 1980, 19p AID-PN-AAH-806
Contract AID/TA-C-1356

Keywords: *Asia, *Urbanization, *Economic development, Population migration, Demography, Urban development, Regional planning, Urban planning, Population growth, Developing country application.

Although 12 of Asia's metropolitan centers are among the world's 35 largest cities, and half of all Asians are expected to be urbanites by the year 2000, this report on urbanization and spatial patterns in East and Southeast Asia argues that it is not the pace but the pattern of urbanization which poses problems for developing countries.

PB82-259490/GAA PC **A04**/MF **A01**
National Research Council, Washington, DC.
Fertility and Mortality Changes in Honduras, 1950-1974.
Rept. no 3,
Kenneth Hill. 1980, 71p AID-PN-AAJ-512
Grant AID/DSPE-G-0061

Keywords: *Fertility, Population, *Honduras, Statistical data, Developing countries, Developing country applications.

Honduras, a small country having only 2.66 million people in 1974, experienced a marked decline in mortality from 1950-74. This fact, plus the wealth of various types of demographic data available, make Honduras an ideal subject for this case study, one of a series of national population studies, of changes in mortality, fertility, and population growth during the period 1950-74. A glossary of terms and a 14-item bibliography (1964-81) are appended.

PB82-259557/GAA PC **A08**/MF **A01**
National Botanical Research Inst., Lucknow (India).
Dhaincha for Seed Gum; Dehydration of Flowers and Foliage; Damask Rose for Rose Oil and Rose Water; Matricaria for Blue Oil; Control Noxious Algae in Garden Tanks and Ponds; Mass Propagation of Dioscorea floribunda by Tissue Culture; and Extraction of Jasmine Flower Oil.
Extension bulletin 1-7,
V. Chandra, M. A. Kher, H. P. Srivastava, P. N. Misra, and P. N. Saxena. c1980, 157p

Keywords: *Oilseed crops, Cultivation, Planting, Algae, Pest control, Production, Dehydration, Ornamental plants, Plant reproduction, India, Developing country application, Perfume.

Contents: 'Dhaincha' for seed gum; Dehydration of flowers and foliage; 'Damask' Rose for rose oil and rose water; Matricaria for blue oil; Control noxious algae in garden tanks and ponds; Mass propagation of Dioscorea floribunda by tissue culture; Extraction of jasmine flower oil.

PB82-259565/GAA PC **A02**/MF **A01**
International Rice Research Inst., Los Banos, Laguna (Philippines).
Differential Response of Rice Varieties to the Brown Planthopper in International Screening Tests,
D. V. Seshu, and H. E. Kauffman. Aug 80, 16p 52, AID-PN-AAJ-130
Contract AID/492-1310-T

Keywords: *Rice, *Plants(Botany), *Insects, *Southeast Asia, Tolerances(Physiology), Plant diseases, Philippines, Responses, Solomon Islands, Selection, Developing country application, Brown planthoppers.

The brown planthopper (BPH), Nilaparvata lugens, has become a serious threat to rice production in several South, Southeast, and East Asian countries. This paper discusses results of International Rice Brown Planthopper Nursery (IRBPN) screening tests conducted 1975-79 with special reference to understanding biotype variations in BPH and identifying sources of genetic resistance to these biotypes. The number of rice varieties tested ranged from 41 in 1975 to 162 in 1979 and included several traditional tall varieties and improved semidwarf breeding lines.

PB82-259573/GAA PC **A04**/MF **A01**
Columbia Univ., New York.

Family Planning: Its Impact on the Health of Women and Children,
Deborah Maine. 1981, 60p AID-PN-AAJ-557
Contract AID/DSPE-CA-0043

Keywords: *Birth control, *Health, Infants, Females, *Contraceptives, *Women, *Children, Statistical data, Population growth, Abortion, Health, Developing countries, *Family planning, Developing country application.

The enormity of the maternal/child health problems facing developing countries is evident from the fact that two-thirds of their people are either children under 15 or women of child-bearing age. This report explores how family planning (FP) can help avoid or reduce some of these problems. Using research data from 37 developing and developed countries, the author shows that a child's chances of surviving the first few years of life are reduced if children are born close together in time; the family already has three or more children; and the mother is under 20 or over 35. The author recommends continuing and expanding FP programs in developing countries. An 87-item bibliography (1938-81) in English and Spanish is appended.

PB82-259599/GAA PC **A09**/MF **A01**
American Public Health Association, Washington, DC.
Report of Strategy Advisory Group on Anti- Malaria Support Strategy for Tropical Africa,
Herbert T. Dalmat, John C. Eason, and A. E. Farwell. 18 Apr 80, 179p AID-PN-AAJ-100
Contract AID/SOD/PDC-C-0164

Keywords: *Diseases, *Malaria, Developing countries, *Africa, Infectious diseases, Public health, Therapy, Drug therapy, Strategies, Developing country application, Disease control.

Malaria is the greatest threat to life and socioeconomic development in tropical Africa. Given a problem of such magnitude, A.I.D. convened a Strategy Advisory Group to determine if donor assistance can avert or at least blunt malaria's devastating impact in the area. This report summarizes the Group's findings, identifies achievable malaria control goals, techniques and approaches to reach those goals, the steps which African countries must take, and the response required of donors. Since the eradication of malaria is currently unfeasible in all but the coastal islands of Africa, a more limited goal must be adopted, namely, of 'controlling' or reducing the prevalence of malaria so that it is no longer a major public health problem in tropical Africa. The report lists 18 constraints to this goal while highlighting four of them: inadequate training facilities, limited resources, inflation, and inadequate assignment of priority to malaria problems.

PB82-259607/GAA PC **A04**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Guatemala's Rural Health Paraprofessionals,
Forrest D. Colburn. 1981, 65p PP-2, AID-PN-AAJ-638
Contract AID/ta-BMA-8

Keywords: *Health, *Health care delivery, *Guatemala, Effectiveness, Development, Implementation, Public health, Developing countries, Developing country application, Delivery of health care.

To redress the frequent bias of developing country health care systems toward providing high-cost, professional, curative care in urban areas to the neglect of delivering basic health care services in isolated rural areas, paraprofessional health workers are being increasingly used to serve the rural poor. This field study, one of six conducted by Cornell University, reviews the effectiveness of paraprofessionals in rural Guatemala. The origin and development of Guatemala's health paraprofessional program and its implementation in eight villages are reviewed. Despite stiff (and continuing) opposition from the physician-dominated health care community, the Guatemalan Ministry of Public Health and Social Assistance (MOPHSA) created two new layers of auxiliary health personnel to serve the rural poor--village health promoters and Rural Health Technicians (RHT).

PB82-259615/GAA PC **A03**/MF **A01**
Agency for International Development, Washington, DC.

Creating a 'Women's Component': A Case Study in Rural Jamaica,
Elsa M. Chaney, and Martha W. Lewis. Mar 81, 41p AID-PN-AAJ-466
Portions of this document are not fully legible.

Keywords: *Farming, *Rural areas, Rural sociology, *Jamaica, Developing countries, *Women, Households, Case studies, Food products, Developing country application.

To incorporate women into an ongoing integrated rural development project (IRDP) in central Jamaica, USAID's Office of Women in Development (WID) designed and implemented a women's component for the project. This case study documents the genesis of this component and offers suggestions for its potential replication. After a year of operation, IRDP staff were concerned that unless women were involved in project planning and implementation, the IRDP's scope would be restricted to the soil conservation activities which are its main focus and not address the larger concerns of improving the lives of the area's 5,000 families.

PB82-259623/GAA PC **A04**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Women Paraprofessionals in Upper Volta's Rural Development,
Ellen Taylor. 1981, 69p PP-3, AID-PN-AAJ-636
Contract AID/ta-BMA-8

Keywords: *Women, *Rural areas, *Training, Specialized training, Upper volta, Developing countries, Developing country applications.

Throughout the world there is increasing interest in using paraprofessionals in various capacities as frontline development workers to provide services which are acceptable and accessible to the rural poor who often have not been reached by development programs. However, there is minimal empirical knowledge on which to draw for program planning and guidance. This study has sought to remedy this need by analyzing several existing paraprofessional programs to determine which factors affect the paraprofessional's effectiveness. Field studies were conducted of illustrative programs in Guatemala, Bolivia, Senegal, Upper Volta, Sri Lanka and the Philippines. For research purposes the Cornell team defined paraprofessionals as workers (1) with no more than 12 months of pre-service or technical school training; (2) who have direct service contact with rural dwellers; (3) who play a semi-autonomous role in making day-to-day judgments and decision; (4) while operating as part of an organized private or public sector agency. The typical paraprofessional is likely to be indigenous to the service area and to have no more than a primary school education.

PB82-259904/GAA PC **A03**/MF **A01**
Florida Univ., Gainesville.
Evaluation of Waste Citrus Activated Sludge in Poultry Feeds.
Final rept. Jul 76-Jan 79,
Bobby L. Damron, Douglas M. Janky, Robert H. Harms, and Mark F. Hall. Apr 82, 47p EPA-600/2-82-060
Grant EPA-R-803997

Keywords: *Waste disposal, *Animal feeds, *Poultry, Citrus fruits, Proteins, Solid waste disposal, Activated sludge process.

Experiments were conducted on chick broilers and hens to determine the metabolizable energy of citrus sludge. A determination of metabolizable energy values showed that the values decreased as the level of citrus sludge in the diet increased. A series of protein levels were fed to day old chicks for a 3-week period in an attempt to assay the protein quality of citrus sludge. As the level of sludge in the diet increased, its utilization decreased with an almost toxic effect being observed at higher concentrations. Vitamin D3 and citrus sludge were fed to day-old chicks to determine if the minerals contained in the sludge could be causing the destruction of Vitamin D3 in the feed. Experiments were also conducted to evaluate the biological availability of phosphorus contained in the sludge. Citrus sludge was also examined as a source of pigmentation in egg yolks and in broilers.

PB82-259995/GAA PC **A02**/MF **A01**
Camp, Dresser and McKee, Inc., Arlington, VA.
Possible Disinfection of Oral Rehydration Solutions,
Richard Cash, and Lincoln Chen. Nov 80, 18p AID-PN-AAJ-536
Contract AID/DSPE-G-0080

Keywords: *Sanitation, *Water quality, Sterilization, *Potable water, Bacteria, Escherichia coli, Contamination, *Water pollution, Developing country application, Bactericides.

Because people in developing countries are frequently forced to use contaminated water in preparing the oral rehydration solutions (ORS) used to combat the effects of diarrhea, the question has been raised whether and how ORS's can be disinfected. This report summarizes the results of a meeting held by A.I.D. health personnel with consultants to discuss this question. Studies have documented a significant presence of Escherichia coli in ORS's of varying water quality. It is not known, however, whether drinking contaminated ORS results in reinfection or in prolongation of the diarrheal episode or at what point the ORS usually becomes contaminated. If it is assumed that contamination comes from the water itself, several options for disinfection exist: adding a bactericidal agent to home water storage vessels, boiling the water, exposing the mixed ORS to the sun's ultraviolet rays, or adding a disinfectant to ORS packages.

PB82-260126/GAA PC **A05**/MF **A01**
International Fertilizer Development Center, Muscle Shoals, AL.
Bolivia Fertilizer Situation and Recommendations,
M. Terry Frederick, and Robert T. Smith. 1979, 91p AID-PN-AAJ-023
Contract AID-511-165-T

Keywords: *Soils, *Fertilizers, *Bolivia, Utilization, Soil properties, Farm crops, Prices, Demand(Economics), Soil tests, Marketing, Imports, Recommendations, Developing country application.

The second lowest level of fertilizer consumption in South America and exorbitant fertilizer prices are impeding Bolivia's agricultural development. This report reviews Bolivia's fertilizer situation and makes recommendations to improve it. Examined are Bolivia's agricultural potential in terms of climate, soil conditions, and crop production capabilities; indigenous fertilizer raw materials; fertilizer transportation system; future fertilizer manufacturing plans; fertilizer use and practice.

PB82-260134/GAA PC **A05**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Reaching the Assetless Poor: Projects and Strategies for Their Self-Reliant Development.
Special series on landlessness and near-landlessness,
Cheryl A. Lassen. Oct 80, 76p LNL-6, AID-PN-AAJ-647
Contract AID/ta-BMA-8

Keywords: *Regional planning, Participative management, Decision making, Management, Evaluation, Developing country application.

The only assets the landless and near-landless (LNL) possess are their labor and their capacity for collective action. This report questions whether restricting the LNL's participation in development efforts to implementation and reception of benefits without allowing them to participate in the decisionmaking, management, and evaluation processes produces the structural changes needed for long-run, self-reliant development. Because developing country governments often extend only to the district level, lack concrete knowledge of the LNL's situation, and rely on intermediary institutions which favor local elites, the LNL must form themselves into clientele groups to effectively seek public goods and services. To spur this organizing process, catalyst agencies are needed to motivate, inform, and organize the LNL.

PB82-260142/GAA PC **A03**/MF **A01**
International Rice Research Inst., Los Banos, Laguna (Philippines).

Methodology for Determining Insect Control Recommendations.
Research paper series,
J. A. Litsinger, M. D. Lumaban, J. P. Bandong, P. C. Pantua, and A. T. Barrion. Jan 80, 34p IRPS-21, AID-PN-AAJ-081
Grant AID-DSAN-G-0083

Keywords: *Crops, *Pest control, Recommendations, Distribution(Property), Climate, Soil properties. Geography, Farming, Cultivation, Irrigation, Developing country application, Cropping systems.

A cropping systems approach has recently emerged as an effective means of improving insect control--a task which, because of its complexity, high demand on resources, and location-specific nature, has impeded past efforts to produce onfarm yields comparable to those obtained at research stations. This report explains the role of cropping systems research in insect pest control and outlines a methodology for determining insect control recommendations. Cropping systems research entails specifying a given insect pest control technology by taking into account cropping patterns of individual farmers, the geographical and temporal distribution of pests, environmental parameters, cultural practices, and insecticide application methods.

PB82-260159/GAA PC **A02**/MF **A01**
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
Testing an Off-Farm Labor Supply Model in an LDC.
Occasional paper,
Dwight A. Smith, and Richard L. Meyer. 15 May 79, 16p OP-615,, AID-PN-AAH-884
Contract AID/ta-BMA-7

Keywords: *Rural areas, *Income, *Philippines, *Employment, Models, Low income groups, Developing country application.

Although studies have shown off-farm labor (OFL) to be a key source of income for poor rural families in developing countries, the effect of off-farm wage rates on OFL supply remains unclear. This paper reports on a test of a model for analyzing this issue using data from 188 rural households in the Philippines. In the model, the time allocated to OFL by husbands and wives is a function of own on-farm and off-farm wage rates, nonearnings income, and several environmental variables noted below. Results suggest that area small farmers respond to wage rates in allocating household labor time and that farm and household characteristics are significant in explaining response to off-farm wage rates. The model needs to be refined to include children's wage and time allocation and their impact on adult labor supply; to analyze the process of household response to OFL opportunities; and to relate successful OFL to migration decisions. An 11-item bibliography (1958-78) is appended.

PB82-260167/GAA PC **A02**/MF **A01**
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
Rural Financial Markets and Development in Low Income Countries: Some Insights for the U.S.
Occasional paper,
Dale W. Adams. 5 Mar 80, 20p OP-712, AID-PN-AAH-880
Contract AID/ta-BMA-7

Keywords: *Financial management, *Agricultural economics, *Rural areas, *Economic development, Credit, Loans, Developing country application.

Despite the prosperity of U.S. rural financial markets (RFM), recent criticism has been aimed at developing country RFM's patterned after U.S. models. This paper explains why developing country RFM's have excluded small rural borrowers and identifies similar trends now appearing in U.S. RFM's.

PB82-260191/GAA PC **A04**/MF **A01**
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
Aid Hand-Operated Water Pump: A Classic Example of Technology Transfer,
Phillip W. Potts. Mar 81, 53p AID-PN-AAJ-561
Contract AID/ta-C-1354

Keywords: *Water supply, *Water pumps, *Technology transfer, Manufacturing, Operating costs, Installation, Nicaragua, Costa Rica, Dominican Republic, Indonesia, Sri Lanka, Tunisia, Ecuador, Developing countries, Developing country application.

A.I.D.'s technology transfer efforts have enabled various developing nations to produce their own hand-operated water pumps, thereby providing them with improved rural health, a source of pride and employment, and an alternative to costlier imported pumps. This report describes A.I.D.'s project to assess the applicability, initiate the manufacture and installation, and evaluate the performance of locally-produced water pumps in Nicaragua, Costa Rica, the Dominican Republic, Indonesia, Sri Lanka, Tunisia, and Ecuador. A.I.D. and the Georgia Institute of Technology (GIT), the project implementing agent, surveyed various nations' ability to manufacture the pump, their enthusiasm for the endeavor, the pumps' applicability to rural water supply programs (particularly those already involving A.I.D.), and local pump manufacturing costs versus import costs. An initial production run gauged local manufacturers' capabilities.

PB82-260209/GAA PC **A03**/MF **A01**
Academy for Educational Development, Inc., Washington, DC.
Reading by Radio: A Position Paper on the Use of Radio in Teaching Reading Skills for Educational Development,
Maurice Imhoof. Feb 81, 37p AID-PN-AAJ-433
Contract AID/DSPE-C-0051

Keywords: *Education, *Communication, Radio equipment, Developing countries, *Kenya, Psycholinguistics, Developing country application.

This paper discusses the importance of language skills for developing country educational development and the usefulness and appropriateness of radio in advancing these skills. As a tool in the general educational process, radio possesses several advantages; it is low in cost, has immediate appeal, combines easily with other instructional modes, and is suitable for nonliterate audiences. These factors allow radio to improve educational quality and relevance, reduce educational costs, and improve access to education, especially in rural areas. Radio has been widely used for language instruction specifically and has proven especially helpful in upgrading the skills of unqualified teachers. After outlining the profound causal relationship between reading and the development of personal awareness of self and the world, as revealed in contemporary psycholinguistics, and the particular problems inherent in learning to read a second language, the author shows that radio is ideally suited for language instruction since it provides the opportunity to master new and different sounds, to repeat new grammatical devices in a variety of ways, and to practice new vocabulary in entertaining but extensive contexts. The use of radio for language instruction is particularly recommended in developing countries short on finances and long on language arts deficiencies.

PB82-260217/GAA PC **A09**/MF **A01**
Agency for International Development, Washington, DC.
Women in Mauritania: The Effects of Drought and Migration on their Economic Status and Implications for Development Programs,
Melinda Smale. Oct 80, 194p AID-PN-AAJ-464

Keywords: *Farming, *Women, *Economic analysis, *Mauritania, *Income, Farm crops, Farm processing, Households, Population migrations, Drought, Developing countries, Developing country application.

What effects did the drought of the 1970's and male migration have on the lives and income-generating ability of Mauritanian women. This report, based on a study of selected sites in Mauritania, answers that question. A Mauritanian woman's ability to earn an income is largely dictated by her ethnic group. Drought and migration are not new to Mauritania, but the drought of the last 10 years increased and lengthened male absences. Women have responded and adapted in their own characteristic way. Recommendations to increase women's income from productive activities are given by the author.

PB82-260233/GAA PC **A09**/MF **A01**
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
Recent Economic Growth and Rural Financial Markets in Jamaica: Analysis of Performance, Problems and Recommendations,
Douglas H. Graham, Compton Bourne, and Girma Begashaw. Oct 78, 182p AID-PN-AAH-893
Contract AID/TA-BMA-7

Keywords: *Banking, *Financial management, *Jamaica, *Economic analysis, Banking business, Rural areas, Performance evaluation, Credit, Government, Financial management, Developing countries, Developing country application, Market surveys, Funds.

Against a background analysis of the Jamaican economy's accelerating decline from 1965 to 1978, this paper studies the recent performance of Jamaica's rural financial markets (RFM's). From 1970 to 1977, credit increased rapidly, 6.7 fold, in nominal terms, but real growth was only 2.6 fold. Most of the increase came from new programs such as the Self-Supporting Farmer's Development Program (SSFDP) and the Jamaican Development Bank (JDB) with the help of foreign funds as inflation eroded the credit base in older domestic sources such as the Agricultural Credit Board (ACB). This rapid increase in credit within a declining economy has led to delinquency and arrears which have compromised future access to foreign funding sources, and to negative real interest rates which have benefitted large farmers while undermining the viability of the credit institutions themselves.

PB82-260241/GAA PC **A12**/MF **A01**
Development Alternatives, Inc., Washington, DC.
Integrated Rural Development: Making It Work,
George Honadle, Elliott R. Morss, Jerry VanSant, and David D. Gow. Jul 80, 268p AID-PN-AAJ-467
Contract AID-DSAN-C-0065

Keywords: *Rural areas, *Regional planning, *Management techniques, Development, Organizational structure, Management, Technical assistance, Coordination, Implementation, Developing country application, State of the art.

As part of an A.I.D. project to assist managers of integrated rural development (IRD) projects, in which success depends as much on effectively mobilizing complex resources as on technical expertise, this report, based on a 2-year experience in 10 developing countries, presents the state-of-the-art in IRD project management. Around the two key factors of organizational design and managerial tactics, the report details a wide range of perennial problems and choices faced by IRD project managers in delivering goods and services, eliciting local response, and effecting self-sustaining improvements.

PB82-260258/GAA PC **A04**/MF **A01**
Development Alternatives, Inc., Washington, DC.
Integrated Rural Development: Making It Work. Executive Summary,
George Honadle, Elliott R. Morss, Jerry VanSant, and David D. Gow. Jul 80, 55p AID-PN-AAJ-468
Contract AID-DSAN-C-0065

Keywords: *Regional planning, *Rural areas, *Community development, Citizen participation, Organizations, Local government, Technical assistance, Developing country application.

As part of an A.I.D. project to assist managers of integrated rural development (IRD) projects, in which success depends as much on effectively mobilizing complex resources as on technical expertise, this report, based on a 2-year experience in 10 developing countries, presents the state-of-the-art in IRD project management. Around the two key factors of organizational design and managerial tactics, the report details a wide range of perennial problems and choices faced by IRD project managers in delivering goods and services, eliciting local response, and effecting self-sustaining improvements.

PB82-260290/GAA PC **A06**/MF **A01**
Research Triangle Inst., Research Triangle Park, NC.
Rural Development Programs and Their Impacts on Fertility,
Abraham S. David, Laurie Zivetz, Edward Vickery, and William Levine. 1979, 107p AID-PN-AAJ-630

Grant AID/ta-CA-1

Keywords: *Fertility, *Rural areas, Developing countries, Decision making, *Education, Migration, Children, Nutrition, Income, Developing country application, State of the art.

To increase its ability to build antifertility strategies into rural development programs (RDP's), A.I.D. sponsored a series of state-of-the-art papers on the impact of RDP's on fertility decisions. This report presents executive summaries of these papers, along with a framework for synthesizing their key findings. The papers treat, in order, the fertility impact of RDP's that focus on women's roles; education; urban-rural migration; the cost/value of children; land tenure; income; and health/nutrition. Each paper includes an annotated bibliography of pertinent literature, an inventory and fertility-related analysis of hypotheses found in the literature, and an executive summary.

PB82-260308/GAA PC **A03**/MF **A01**
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
Rural Nonfarm Employment: The Recent East Asian Experience,
Economics and Sociology occasional paper,
Richard L. Meyer, and Donald W. Larson. Jul 78, 28p
OP-484, AID-PN-AAH-885
Contract AID/ta-BMA-7

Keywords: *Employment, *Rural areas, *Asia, Taiwan, Japan, South Korea, Income, Developing countries, Developing country application.

Although small, rural, nonfarm firms (SRNF) are often overlooked by development strategists and have often suffered from discriminatory government policies, recent evidence suggests that SRNF's may be able to contribute significantly to farm family income and the national economy. This paper exemplifies this thesis in light of recent East Asian experience. A literature review shows that East Asian SRNF's, in contrast to larger, more 'modern' enterprises, employ substantial unskilled and uneducated labor (20-30% of the labor force and more), use local resources, are less capital-intensive, require little foreign exchange, reduce inter-regional inequities, improve income distribution, encourage investment in agriculture, produce exports, and help link the product and labor markets to small farms. A 31-item bibliography (1961-76) is appended.

PB82-260316/GAA PC **A03**/MF **A01**
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
Funding and Viability of Rural Development Banks.
Economics and Sociology occasional paper,
Compton Bourne, and Douglas H. Graham. Apr 80,
30p OP-720, AID-PN-AAH-892
Contract AID/ta-BMA-7

Keywords: *Banking, *Financial management, *Rural areas, *Agricultural economics, Economic development, Developing countries, Jamaica, Credit, Banking business, Loans, Developing country application.

Using the Jamaican Development Bank as an example, this paper examines the impact of existing funding sources on the viability of rural development banks (RDB) in low-income countries and suggests new sources for RDB funding.

PB82-260324/GAA PC **A03**/MF **A01**
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
Recent Performance of Rural Financial Markets in Low Income Countries.
Occasional paper,
Dale W. Adams. 11 Apr 79, 30p OP-596, AID-PN-AAH-887
Grant AID/ta-BMA-7

Keywords: *Banking, *Financial management, *Rural areas, *Agricultural economics, Demand(Economics), Marketing, Economic development, Developing countries, Credit, Banking business, Loans, Developing country application.

Despite a substantial expansion in the past 30 years, rural financial markets (RFM) have contributed little to development in low-income countries. To bolster this controversial thesis, this paper reviews the recent poor performance of RFM's and identifies its causes.

PB82-260332/GAA PC **A07**/MF **A01**
American Agricultural Economics Association, Lexington, KY.
Training Agricultural Economists for Work in International Development,
Darrell F. Fienup, and Harold M. Riley. Jun 80, 146p
AID-PN-AAJ-096
Contract AID/ta-BMA-4

Keywords: *Training, *Education, Students, Surveys, Assessments, United States, International relations, Developing country application, *Agricultural economists, Training programs, Advanced programs.

Because precise knowledge has been lacking regarding the training needs of the increasing number of developing country students receiving U.S. graduate training in agricultural economics (AE), some 750 developing country alumni of U.S. AE graduate programs were surveyed to determine how they assess their training; analyze the status of AE in developing countries; and map a strategy for improving U.S. AE programs. Respondents to the survey, results of which are presented here, cited the following major strengths of U.S. graduate training programs: comprehensive training in theory and quantitative methods; flexible programs allowing breadth and depth in training; good student-faculty interaction; and a favorable climate for learning and research.

PB82-260340/GAA PC **A19**/MF **A01**
International Crops Research Inst. for the Semi-Arid Tropics, Hyderabad (India).
Proceedings of International Workshop on Socioeconomic Constraints to Development of Semi-Arid Tropical Agriculture, 19-23 February 1979, Hyderabad, India,
J. G. Ryan, and H. L. Thompson. Feb 79, 431p AID-PN-AAJ-522
Contract AID/ta-G-1406

Keywords: *Agricultural economics, *Agriculture, Social effect, Economic factors, *Tropical regions, Farming, Soils, India, Grains(Food), Marketing, Risk, Decision making, West Africa, Developing country application, Dryland farming.

New technologies cannot be disseminated in developing countries without an understanding of local socioeconomic conditions. Such is the view adopted by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in sponsoring the International Workshop on Socioeconomic Constraints to Development of Semi-Arid Tropical Agriculture, held February 19-23, 1979 in Hyderabad, India, of which this report comprises the proceedings. The Workshop's primary aim was to consider ways and means of overcoming the various socioeconomic constraints to agricultural development in the semi-arid tropics (SAT) and emphasis was focused on the role new technologies and/or policies could play in alleviating development constraints in SAT.

PB82-260357/GAA PC **A10**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Animation Rurale and Rural Development: The Experience of Senegal,
Sheldon Gellar, Robert B. Charlick, and Yvonne Jones. Oct 80, 224p AR-2, AID-PN-AAJ-634
Contract AID/ta-BMA-8

Keywords: *Rural areas, *Cooperatives, *Economic development, Cooperation, Control, Planning, Strategies, Development, *Senegal, Developing country application.

After 20 years (1959-79), the theory of 'Animation Rurale' (AR), which emphasizes cooperative village control of economic institutions, has been discarded as a basis for rural development planning in Senegal. To explain this abandonment, this study traces, in the light of Senegal's rural development context and AR theory/methodology, the history of AR in Senegal, the AR techniques used, and AR's use in specific regions.

PB82-260365/GAA PC **A05**/MF **A01**
Centro Internacional de Mejoramiento de Maiz y Trigo, Mexico City.
Planning Technologies Appropriate to Farmers: Concepts and Procedures.
1980, 79p AID-PN-AAJ-526
Contract AID-DSAN-G-0216

Keywords: *Photovoltaic power system, *Electric power, *Agriculture, Concepts, Recommendations, Government policies, Instructions, Surveys, Marketing, Rainfall, Decision making, Income, Developing country application, Appropriate technology.

A key reason preventing farmers in developing countries from adopting fully the technologies recommended to them by researchers and extensionists is the inappropriateness of the technologies themselves. This manual was prepared to present procedures and guidelines to assist agricultural researchers in formulating technologies truly appropriate to farmer needs and is divided into three parts. Part I presents an overview of a research program aimed at developing appropriate technologies. Part II describes procedures for obtaining information on these circumstances. In Part III, methods are discussed for gleaning from survey results the information pertinent to planning crop research.

PB82-261025/GAA PC **A03**/MF **A01**
Vrije Univ., Amsterdam (Netherlands).
Models of Know-How and Technics Transfers in the International Order,
F. H. Brookman. 1982, 48p 1982:1

Keywords: *Technology transfer, *Research and development, International relations, Economic development, Developing countries, Populations, Research projects.

The report explains and evaluates the methods of technology transfer, particularly those methods used to transfer technology to less developed countries.

PB82-261090/GAA PC **A05**/MF **A01**
Assam Agricultural Univ., Jorhat (India). Directorate of Research.
Salient Research Findings - 1978-79,
L. P. Upadhaya. 1980, 84p
Portions of this document are not fully legible.

Keywords: *Farming, *Crops, *India, Plant reproduction, Breeding, Rice plants, Plant diseases, Weed control, Fertilizers, Plant growth, Grain crops, Soybean plants, Pest control, Insects, Marketing, Sugarcane, Plant pathology, Developing country application.

This report includes research findings of the Assam Agricultural University in the field of agricultural science. The major areas of research are: cereals; grain legumes; soybean, oilseeds; sugar crop; potato; forages; fibre crops; hill agriculture; farm forestry; water management; stored grain pests and control of rodents; fungal diseases; and efficient use of fertilizers.

PB82-261108/GAA PC **A04**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Pilot Sample Survey for Estimating Yield of Cotton in Hissar (Haryana).
Annual rept. 1976-1977,
S. K. Raheja, P. C. Mehrotra, B. B. P. S. Goel, and V. S. Rustogi. 1978, 55p

Keywords: *Cotton, *Agricultural economics, *India, surveys, Yield, Cotton plants, Forecasting, Developing country application.

With a view to develop suitable sampling methodology for forecasting and estimating the yield of cotton, a pilot sample survey was conducted in the Hissar district of Haryana, India. The survey covered both high yielding and local varieties of cotton.

PB82-261181/GAA PC **A06**/MF **A01**
Indian Adult Education Association, New Delhi.
Preparation of Problem-Oriented Learning Materials,
Virendra Tripathi, and V. N. Singh. Sep 75, 117p
SER-108

Keywords: *Education, Specialized education, Motivation, Books, Instructors, *India, Developing country application.

This is a report of the National Training Workshop held at Literacy House, Lucknow, India, from September 4-9, 1975. Discussion sheets are presented on: Family life education material; problem-based learning materials for non-formal education; problem-oriented learning materials on bajra cultivation; problem-oriented learning materials on bajra cultivation development; methods and techniques of preparing problem-oriented learning materials; curriculum development for preparing problem-oriented learning materials; techniques of developing problem-based learning materials; and administering problem finding survey schedules. The seminar recommended that materials be prepared with both the instructor and the student in mind, and prepared in local languages. The problems should be identified through community participation and the materials prepared accordingly.

PB82-261199/GAA PC **E03**/MF **E03**
Commission of the European Communities, Luxembourg.
Reports of the Scientific Committee for Animal Nutrition (Third series).
c1981, 33p IA-)ISBN-92-825-2552-X, EUR-7383-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Keywords: *Animal feeds, Chlorine organic compounds, Food additives, Silage, Hydrochloric acid, Sulphuric acids, Dispersants, Polyoxyethylene, Emulsifying agents, Fumaric acid, Maleic acid, Proteins, Regulations, Dosage, Escherichia coli, Immunity, Swine, Chickens, Europe, Purinamine/(chloro-fluorophenylmethyl).

The topics on feed additives considered are: fumaric and maleic acids as preservatives of feedingstuffs, hydrochloric and sulphuric acids as preservatives in silage and molasses feed, the dispersant polyethylene glycol 6000, and the emulsifier polyoxypropylene-polyoxyethylene polymer, the coccidiostat arprinocid for chickens, and inactivated cultures of certain enteropathogenic Eschericia coli serotypes to elicit and maintain surface intestinal immunity in piglets. The Committee finds that the proposed conditions of use are satisfactory. Dosage of arprinocid, teratogenic for rats and mice but not for rabbits, should be withdrawn at least five days before slaughter. Guidelines for the assessment of microorganism protein, intended for animal feed, are laid down. (Copyright (c) ECSC-EEC-EAEC, Brussels - Luxembourg, 1981.)

PB82-261207/GAA PC **A07**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Monograph on Estimation of Incidence of Crop Pests and Diseases and Yield Losses,
Daroga Singh, and R. K. Khosla. 1981, 145p

Keywords: *Plant diseases, *Pest control, *Crops, *India, Losses, Yield, Soybean plants, Corn plants, Grain sorghum plants, Developing country application.

It is a known fact that the pests and diseases cause considerable crop losses in every season in this country, but reliable and objective estimates of incidence of pests and diseases and also crop losses in quantitative terms are not available. This monograph will serve as guidelines to the research workers for conducting the sample surveys for estimation of incidence of pests and diseases and consequent quantitative crop losses.

PB82-261215/GAA PC **A04**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Monograph on Statistical Studies on the Behaviour of Rainfall in a Region in Relation to a Crop,
P. N. Bhargava, P. Narain, D. Singh, and Asha Saksena. 1977, 75p

Keywords: *Crops, *India, Statistical analysis, Moisture, Estimating, Developing country application.

Recognizing the important role of rainfall in increasing or depressing the crop production and lack of availability of statistical methodology for their investigation, Institute of Agricultural Research Statistics initiated studies for the development of a statistical methodology to investigate the various aspects of rainfall in a particular region in relation to crop. In this monograph the statistical methodology developed for various aspects of rainfall in relation to a crop as well as the results obtained are discussed.

PB82-261777/GAA PC **A03**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Estimation of Birth and Death Rates in Bovine: A Pilot Survey in Andhra Pradesh.
T. Jacob, B. Marutiram, and S. N. Arya. 1978, 35p

Keywords: *Livestock, *India, Surveys, Mortality, Birth, Age, Fertility, Animal diseases, Developing country application.

Estimation of projected population of animals is essential for formulating scientific plans for increasing livestock production. The report contains results and discussions pertaining to population structure; breed composition; age distribution; fertility rates; mortality rates; combined ratio estimates; and causes of mortality.

PB82-261785/GAA PC **A04**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Estimation of Area of Grazing Land and Its Utilization, Jhansi District (Uttar Pradesh): A Pilot Survey,
K. C. Raut, U. G. Nadkarni, B. C. Saxena, and P. R. Sreenath. 1978, 68p

Keywords: *Grass, *Agricultural economics, *India, Grasses, Yield, Forage crops, Area, Feeding stuffs, Estimating, Developing country application.

The object of the survey was to evolve a suitable sampling technique for estimating, with a reasonable degree of precision; (i) the area of grazing land; (ii) the average yield per unit of grazing area in different seasons; (iii) the composition of grazing available and its chemical contents in each season; and (iv) to obtain information on grazing practices followed in utilizing the grazing area available.

PB82-261942/GAA PC **A06**/MF **A01**
Puerto Rico Administration of Regulations and Permits, Santurce.
Codigo para la Conservacion de Energia en Edificios en Puerto Rico (Code for Energy Conservation in Buildings in Puerto Rico).
1979, 108p
Text in Spanish.

Keywords: *Energy management, *Buildings, Air conditioning, Heating, *Puerto Rico, Regulations, *Energy conservation, Developing country application.

Energy conservation is part of a comprehensive energy program for Puerto Rico. The Puerto Rican Office of Energy has recently concentrated on developing a balanced energy conservation plan, emphasizing the adaptation of building construction to reduce the amount of energy used for lighting, air conditioning, and power in general, while also attempting to identify opportunities for maximum heating efficiency. The building construction program involves establishing lighting and heating efficiency standards to be implemented by the Administration of Regulations and Permits through the adoption of a building regulations supplement (Planning Regulations No. 7), which will be known as the 'Code for Energy Conservation in Buildings in Puerto Rico'. The code, developed under the auspices of the Puerto Rican Office of Energy with funds provided by the U.S. Department of Energy and with the participation of those government agencies that must comply with public energy conservation policy in Puerto Rico, includes general provisions, design criteria and conditions, technical standards, etc. The technical provisions of Standard 90-75 and proposed revisions 90-75R of the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), criteria of the Federal Energy Administration and Federal General Services Administration, and the provisions of the current Model Energy Code in the United States were considered in preparing the code.

PB82-262064/GAA PC **A05**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Sampling Methodology for Estimation of Meat Production.
D. Singh, J. S. Maini, B. B. P. S. Goel, and G. S. Bassi. 1978, 89p
Portions of this document are not fully legible.

Keywords: *Agricultural economics, *Animal husbandry, *India, Surveys, Meat, Livestock, Statistical data, Marketing, Prices, Feeding stuffs.

The Indian Agricultural Statistics Research Institute has been engaged in the work of developing an integrated sampling technique for simultaneous estimation of principal livestock products. Two pilot investigations for the purpose were conducted in the Northern and Southern regions. This report deals with the results of the data on estimation of meat production and related aspects for the surveys conducted in both the regions.

PB82-262197/GAA PC **A03**/MF **A01**
Puerto Rico Administration of Regulations and Permits, Santurce.
Sugerencias para Supervisores (Suggestions for Supervisors).
1979, 34p
Text in Spanish.

Keywords: *Training, *Management techniques, Government employees, Motivation, Management methods, Characteristics, Attitudes.

The performance of a government office and its image depend primarily on its personnel and their feelings. This booklet was written in order to provide all supervisors with the means to develop expertise in human relations.

PB82-262205/GAA PC **A03**/MF **A01**
Indian Adult Education Association, New Delhi.
Non-Formal Education: A Remedy and a Restorer,
Oct 75, 47p SER-104

Keywords: *Education, *India, Youths, Females, Farms, Policies, Urban areas, Developing country application.

The 28th All India Adult Education Conference on Non-Formal Education was held in Jabalpur, Madhya pradesh, India from October 25-27, 1975. The conference discussed the subjects following: Non-formal education for school dropouts; Non-formal education for youth-age group 15-25; Non-formal education for women, Non-formal education for farmers, Non-formal education for industrial workers; and Policy for non-formal education and its financing. The seminar concluded that non-formal education was relevant for educating those of school age and those out of school with particular usefulness in improving the skills and productivity of urban workers, encouraging more intensive and fruitful participation of women in community activities, and programs of civic education. The seminar called on more universities to start non-formal education programs.

PB82-262270/GAA PC **A02**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digests: Building Protection,
B. C. Srivastava, J. S. Sharma, M. Aslam, Shiva Mohan Singh, and M. P. Jaisingh. 1977, 25p

Keywords: *Buildings, *Construction, Waterproofing, Cleaning, Water content, Walls, Roofs, Developing country application.

This document is a compilation of 5 bulletins. These are: water-proofing of prefabricated roofing schemes; damp proofing of existing buildings by latex-siliconate; dampness in buildings; insertion of damp-proof course in existing walls; and protection of buildings against vegetative growth. These bulletins provide comprehensive, step-by-step instructions for carrying out the techniques described.

PB82-262288/GAA PC **A03**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digests: Manpower and Material Requirements for Buildings,
S. Singh, G. C. Sofat, A. K. Jethi, and S. K. Jain. 1981, 33p

Keywords: *Building materials, *Buildings, *Construction, Construction materials, Materials specifications, Residential buildings, Office buildings, Labor estimates, Developing country application.

This document is a compilation of 4 bulletins. An attempt has been made to obtain the required information with the help of simple equations which make it very speedy. The quantities of materials and labor required for a building are directly computed for a given plinth area with the help of certain empirical equations. The analysis has been made for the building portion of single, double and four-storyed residential buildings, building services and office buildings.

PB82-262296/GAA PC **A05**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digests: Heating and Thermal Aspects of Building,
Prakash Chandra, K. N. Agarwal, S. P. Jain, M. R. Sharma, and Sharafat Ali. 1981, 94p

Keywords: *Buildings, Thermal radiation, Thermal insulation, Solar radiation, Environmental engineering, Structural design, Developing country application.

This document is a compilation of 14 bulletins. These are: Thermal Performance of Building Sections in Different Thermal Climatic Zones of the Country; Thermal Response of 4.5 inch Solid Brick Wall Room in Hot-Dry Climates; Evaluation of Thermal Stress-Tropical Summer Index; Correction Factors for Thermal Performance Index; Thermal Performance Rating and Classification of Walls in Hot Climate; Thermal Performance Rating and Classification of Flat Roofs in Hot Dry Climates; Thermal Insulation at Low Temperature; Thermal Data of Building Fabrics and its Application in Building Design; Assessment of Solar Radiation on Buildings; Determination of Tropical Summer Index in Office Buildings; Determination of Sunlight Penetration Indoors; Orientation of Buildings; The Climatic and Environmental Zones for India - Simplified Advice for Building Design; and Thermal Considerations in Building Design - Insulated Masonry Structures. These bulletins provide comprehensive, step-by-step instructions on how to make full use of the techniques described. Many graphs and charts are provided.

PB82-262304/GAA PC **A03**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digests: Concrete, Cement, and Bricks,
P. L. De, B. D. Mittal, C. A. Taneja, Shiva Mohan Singh, and S. S. Rehsi. 1976, 42p

Keywords: *Buildings, *Construction, *Concrete, *Cement, Concrete blocks, Cements, Concrete durability, Masonry, Bricks, Developing country application.

This document is a compilation of 9 bulletins. These are: Concrete Building Blocks and Block Masonry; Accelerated Testing of 28-Day Strength of Concrete; Sea Water for Making Concrete; Foamed Concrete Blocks; Removal of Stains from Concrete Floors; Deterioration of Concrete in Sulphate and Soft Waters; Autoclaved Aerated Concrete; and Economy in the Use of Cement. These bulletins give comprehensive, step-by-step instructions on how to make use of the materials and procedures covered. Three additional bulletins have been added to this booklet. They are: Lime Bursting in Bricks; Flyash Mortar for Brick Masonry; and Brick Earths of India.

PB82-262361/GAA PC **A04**/MF **A01**
Indian Adult Education Association, New Delhi.
Curriculum Construction for Non-Formal Education for the Age Group 15-25,
Satyen Maitra. Sep 76, 51p SER-110

Keywords: *Education, *India, Youths, Characteristics, Communities, Requirements, Developing country application.

This is the report of a seminar on youth non-formal education curriculum construction held at Narendrapur, India from September 16-22, 1976. The seminar working paper covered profiling the target group (rural or urban poor, women, tribals), definition and components of a curriculum, & its objectives, content, methods, and evaluation. The seminar recommended that a state board be set up for non-formal education and that it in turn should establish many polytechnics to fill the actual education needs of various communities. The board should also establish the programs to be taught based on the findings of community needs.

PB82-262379/GAA PC **A04**/MF **A01**
Indian Adult Education Association, New Delhi.
Curriculum Construction for Non-Formal Education,
S. C. Dutta, Amrit Kaur, R. K. Singh, Rita Maitra, and Susheela Bhan. Oct 76, 55p SER-113

Keywords: *Education, *India, Youths, Females, Rural areas, Financing, Developing country applications, Curricula.

This is the report of a seminar on non-formal education curriculum construction held in Mysore, India from October 15-18, 1976. Subgroups discussed curriculum construction for women, for age group 6-14, for age group 15-25. All the groups agreed that the curriculum for their respective target groups should be flexible, diversified, need-based, and should link environment and deal with problems which have been identified through a survey of the area. The curriculum should have a multimedia approach and awareness, understanding, skill, and action must be integrated in the preparation of the content. Non-formal education should be considered as essential to integrated rural development. 10% of each state board of education's budget should be allocated to non-formal education.

PB82-262387/GAA PC **A03**/MF **A01**
Indian Adult Education Association, New Delhi.
Curriculum Construction for Non-Formal Education of Women,
T. A. Koshy. Sep 76, 42p SER-109

Keywords: *Education, *India, Females, Rural areas, Urban areas, Instructors, Developing country application, Curricula.

This is the report of a seminar on non-formal education for women held at Sri Venkateswara University, Tirupati, Andhra Pradesh, India from September 5-9, 1976. The aim of the workshop was to lay down guidelines for curriculum construction and to prepare a draft curriculum by taking specific subject areas pertaining to women's non-formal education, both urban and rural. It concluded that all socio-economic schemes and programs for the benefit of women should have a built-in component of non-formal education. The curricula should be adapted to the local conditions and purpose. The draft curriculum should be pre-tested or at least discussed with participants before the teaching materials are prepared. Non-formal education teachers need a higher level of competence and understanding than normal teachers and should be compensated accordingly. Quick surveys will suffice for evaluation, and should not take longer than 6 weeks.

PB82-262395/GAA PC **A09**/MF **A01**
Indian Adult Education Association, New Delhi.
Manual for Adult Literacy Teachers,
N. R. Guptac. Mar 71, 190p SER-85

Keywords: *Education, *India, Literacy, Instructors, Instructional materials, Developing country application.

Short unrelated literacy courses will not end illiteracy. A relapse is bound to occur. A relapse can be prevented only by correlating the teaching to the learners' daily life needs. They must have the knowledge given to them which they must use daily and they must not have it thrust upon them. This book sets out how to achieve lasting literacy. Its chapters are entitled: Why Adult Literacy; Magnitude of the Problem of Illiteracy; Processes of Adult Learning; Organization of Adult Literacy Classes; Reading Materials; Methods of Adult Literacy; Audio-visual Aids in Adult Literacy and Education; the Role of Libraries; Adult Literacy - Team Work; Example is Better than Precept; Followup Programs; Testing the Progress of the Learners; and Adult Literacy Records. Annexures include an outline syllabus of functional literacy, statistics of literacy in India, and educative group songs. The songs and sample tests are in Hindi.

PB82-262403/GAA PC **A02**/MF **A01**
Assam Agricultural Univ., Jorhat (India). Directorate of Research.
Mineral Deficiency Symptoms of Three High Yielding Varieties of Rice.
Research bulletin no. 5,
D. N. Chakravarty, and B. C. Barthakur. Jun 80, 14p
Color illustrations reproduced in black and white.

Keywords: *Nutrition, *Minerals, Signs and symptoms, Diets, *Rice, India, Nitrogen, Sulfur, Potassium, Calcium, Magnesium, Phosphorous, Developing country application, Assam(India).

Since sufficient work has not yet been done to study the visible nutritional disorders of major nutrient elements in rice, an attempt was made to study the visible deficiency symptoms of these elements in three popular high yielding varieties of rice of Assam. This report contains the experiment and the results. It was found that the deficiency symptoms caused due to lack of nitrogen appeared within 7 days from the date of transplanting and these were followed by sulphur, potassium, calcium, magnesium, and phosphorous, in that order, and the absence of any of the major elements and their combinations reduced plant growth and root development to a considerable extent.

PB82-262411/GAA PC **A02**/MF **A01**
Assam Agricultural Univ., Jorhat (India). Directorate of Research.
Nematode Pests of Crop Plants - An Appraisal with Special Reference to Research Work in Assam.
Research hand-out no. 1,
P. N. Phukan. Sep 80, 25p

Keywords: *Crops, *Pest control, *India, Life cycles, Nematocides, Pesticides, Fungus diseases, Vegetables, Rice plants, Citrus trees, Tropical regions, Developing country application, Roots.

Importance of the study of plant parasitic and free-living nematodes is now well recognized in almost all countries of the world. Nematodes have been causing damage to agricultural crops either singly or in association with other pathogens, greatly so in the tropical and subtropical regions. This bulletin records the work done by the University in the study and control of nematodes.

PB82-262429/GAA PC **A12**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Indian Agricultural Statistics Research Institute Annual Report 1979: Golden Jubilee Special.
R. K. Khosla, and D. P. Singh. 1979, 270p

Keywords: *Education, *Agricultural economics, *India, Statistics, Farm crops, Forecasting, Genetics, Animal husbandry, Developing country application.

IASRI is the premier institute in the country specializing in agricultural statistics. Its objective is to conduct and promote research and training in agricultural statistics. In this report, major research activities have been highlighted. The major areas of research are: Statistical research in crop science; Crop forecasting methodology; Statistical research in animal sciences; Statistical genetics; Sample survey methodology; and Econometric analysis.

PB82-262494/GAA PC **A03**/MF **A01**
National Science Foundation, Washington, DC. Div. of Science Resources Studies.
Problems of Small, High-Technology Firms.
Special rept.,
William L. Stewart, and Norman W. Friedman. Dec 81, 43p NSF-81-305
See also PB-263 779.

Keywords: *Technology transfer, Financing, Regulations, Marketing, Manpower, Expenses, *Small businesses, *Research and development, Venture capital.

The report summarizes the findings of a 1977 National Science Foundation mail survey of small, high-technology companies active in research and development and of a series of in-depth interviews held in 1979. Firms were questioned about eleven problem areas dealing with finance, personnel, government regulations and other concerns such as high-risk research and development and transition from research and development to marketing.

PB82-262502/GAA PC **A06**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Sampling Methodology for Estimation of Egg Production and Study of Poultry Keeping Practices,
D. Singh, J. N. Garg, B. B. P. S. Goel, K. B. Singh, and M. Rajagopalan. 1977, 107p

Keywords: *India, *Agricultural economics, Surveys, Meat, Milk, Byproducts, Poultry, Eggs, Production, Developing country application.

The Indian Agricultural Statistics Research Institute carried out pilot sample surveys in different animal husbandry regions of the country for developing a suitable sampling methodology for estimation of annual output of principal livestock products. This report deals with the estimation of egg production and study of poultry keeping practices from the data collected in Northern and Southern regions of India.

PB82-262510/GAA PC **A04**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Estimation of Production of Lac,
D. V. S. Rao, and S. D. Bokil. 1978, 52p

Keywords: *Insects, *Agricultural economics, *India, Surveys, Yield, Shellac, Exports, Estimating, Developing country application, Hosts.

A pilot sample survey for the estimation of lac production was carried out in the Palamau district of Bihar State during the years 1975-77. The main objective of the survey was to develop a suitable sampling technique for the estimation of number of lac hosts, number cultivated, total production of stick lac and average yield per tree. In addition, some studies on the socio-economic aspects of lac cultivation and on prediction of the average yield of stick lac are given in the report.

PB82-262627/GAA PC **A04**/MF **A01**
Economic Research Service, Washington, DC. Economic Development Div.
Management Capacities of Rural and Small Cities: An Exploratory Overview.
Staff rept.,
Beth Walter Honadle. Jul 82, 75p AGES-820721

Keywords: *Management planning, *Rural areas, *Urban planning, Public relations, Upgrading, Personnel, Information services, Land use, Data processing, Forecasting.

Smaller, nonmetropolitan cities have different needs and management practices from their larger, urban counterparts. For instance, the smaller nonmetro cities are more likely to use line-item budgets. They are less likely to engage in cooperative purchasing agreements, to have budget manuals, or to use centralized purchasing. They are also less likely to offer employee incentives. Among the highest priority planning and management needs of nonmetropolitan cities are (1) community relations skills, (2) upgrading personnel, (3) information gathering and analysis capabilities, (4) forecasting, (5) land use plans, and (6) data processing.

PB82-262650/GAA PC **A03**/MF **A01**
Indian Adult Education Association, New Delhi.
Non-Formal Education for School Dropouts and Youth.
1975, 46p SER-106

Keywords: *Education, *India, Youths, Schools, Attitudes, Developing country application, Dropouts.

The workshop studied the reasons for school dropouts and the programs of non-formal education for the age group 6-14. The symposium studied the needs and programs of non-formal education for the youth.

PB82-262668/GAA PC **A10**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Impact of Milk Supply Schemes on the Rural Economy in Milk Collection Areas of Delhi Milk Scheme.
J. P. Jain, K. P. S. Nirman, K. G. Aneja, and Prem Narain. 1978, 222p

Keywords: *Milk, *Agricultural economics, *Rural areas, *India, Production, Forage crops, Livestock, Dairies, Employment, Developing country application.

A series of surveys for developing a suitable methodology for assessing the impact of urban milk supply schemes on rural economy in the milk-shed areas was carried out. This report deals with the sampling plan estimation procedure as also estimates of various response indicators for the bench-mark and repeat surveys, and the estimates of the impact of the Delhi Milk Scheme as measured in terms of these indicators. This report also contains a lot of incidental information on milk production and its utilization in the area, productivity of cultivated fodder and other crops, employment pattern, and economic status of rural families.

PB82-262890/GAA PC **A08**/MF **A01**
Florida Univ., Gainesville.
Impact of Aquatic Plants and Their Management Techniques on the Aquatic Resources of the United States: An Overview.
Final rept.,
Jerome V. Shireman, William T. Haller, Daniel E. Canfield, and Vernon T. Vandiver. Jul 82, 157p EPA-600/4-81-007
Grant EPA-R-805497

Keywords: *Weed control, *Aquatic plants, *Herbicides, *Water pollution, Assessments, Toxicity, Marine microorganisms, Chlorine organic compounds, Chlorine aromatic compounds, Water quality management, Nitrogen organic compounds, Copper sulfates, Algae, Invertebrates, Environmental impacts, Crustacea, Dosage, Lakes, Estuaries, United States, Biological pest control, Water hyacinths, Eurasian watermilkfoil, D 2-4 herbicide, Diquat.

This paper provides an assessment of nuisance aquatic plants and the problems associated with their control in the United States. Major emphasis is given to the Sun Belt states where aquatic plant control is critical due to introduction of exotic plants and extended growing seasons. The impact of aquatic plants (algae, non-native, and native plants) and their management techniques are discussed as they pertain to water quality and aquatic life. Herbicide residue data, both in the soil and water, and herbicide toxicity to aquatic organisms are presented and discussed.

PB82-262957/GAA PC **A04**/MF **A01**
Central Building Research Inst., Roorkee (India).
For Building and Construction.
Technical notes,
G. D. Bansal, Devendra Sharma, Chandra Prakash, K. R. Rao, and S. P. Jain. 1981, 58p

Keywords: *Buildings, *Construction, Building materials, Thermal insulation, Construction materials, Pile caps, Solar heating, Roofs, Flameproofing, Chimneys, Developing country application, Thatch roofs.

This document is a compilation of 16 Technical Notes. These are: Apertures other than Northlights; Design of pile caps; thermal insulation of roofs of industrial buildings; room heating by solar energy; charging device for small capacity lime kilns; waste water disposal system for rural areas; low cost sound absorbing materials; solar space heating system; pedestal piles for low cost houses; solar timber seasoning kiln; design of cold storage for fruits and vegetables; techniques for improved thatch roofs; resilient floors for structural noise reduction; plastic composite panels for partition claddings and flush doors; chimney design for domestic kitchens; and a cheap and effective fire retardant treatment for paddy thatch/coconut leaves/palmyrah thatch. The notes give brief descriptions of the design and use of the materials and techniques covered.

PB82-263013/GAA PC **A04**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Technique Series: Data Sheets,
M. P. Jaisingh, Lathika Jaisingh, S. K. Jain, N. N. Bhise, and K. N. Sharma,. 1978, 66p

Keywords: *Buildings, *Construction, *Reinforced concrete, Masonry, Precast concrete, Architectural concrete, Structural design, Roofs, Floors, Shelves, Developing country application.

This document is a compilation of 6 Data Sheets. They are: Thin Precast RCC Lintels in Brickwalls; Cored Unit for Roof/Floor; Channel Unit for Floor/Roof; Waffle Unit for Roof/Floor; Precast Shelving Units for Dwellings; and L-Pan Roofing. The Data Sheets contain descriptions of the materials, their advantages and disadvantages, and charts and diagrams for their use.

PB82-263302/GAA PC **A03**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
World Agriculture: Outlook and Situation.
Jun 82, 33p WAS-28

Keywords: *International trade, *Agricultural economics, Exports, Credit, Developing countries, Economic factors, Prices, Wheat, Corn, Soybeans, Cotton, Rice, Grain crops, Tables(Data), Unemployment.

Weakness in the world economy continues to restrain U.S. export values. Low growth rates in the major industrialized countries have boosted unemployment, dampening consumption of food and agricultural products. Limited foreign exchange in many developing countries has curbed their ability to increase food purchases. Also, slowed export growth and credit constraints in some centrally planned countries have diminished their imports.

PB82-264946/GAA PC**$21.50**/MF**$21.50**
Partnership for Productivity, Annandale, VA.
Asesoria para Pequenas Empresas (Consultancy for Small Businesses),
Malcolm Harper. 1976, 275p ISBN-0-903031-42-6
Text in Spanish.

Keywords: *Economic development, Consultants, Management methods, Productivity, *Small businesses, Developing country application.

Spanish translation of English manual which tries to summarize the results of more than 5 years of providing local economic consulting for small businesses in developing countries. The author initially developed a standard method in Kenya and noted a significant and measurable difference in the administrative capabilities and profitability of most clients. The concept was then applied by the Partnership for Productivity on a rather large scale in western Kenya. Subsequent experiments have been conducted in Brazil, Sri Lanka and Indonesia.

PB82-266271/GAA PC **A03**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digests: Cooling of Buildings,
V. V. Verma, K. N. Agarwal, Prakash Chadra, S. P. Jain, and M. R. Sharma. 1981, 47p

Keywords: *Coolers, *Buildings, *Environmental management, Cooling, Thermal insulation, Structural design, Construction materials, Developing country application.

This document is a compilation of 9 bulletins. These are: Control of Solar Heat Gain through Glass Windows; Simple and Effective Roof Spraying System of Cooling Buildings in Hot Dry Climates; Shading Devices for Glass Openings in Air-conditioned Buildings; Cooling of Buildings by Roof Surface Evaporation; Roof-surface Evaporative Cooling of Buildings by Water Soaked Gunny Bags; Loose Fill Materials for Cold Storage Insulation; Cooling Load and Indoor Air Temperature of Office Buildings under Tropical Climate; Thermal Design of Potato Cold Storage; and Suitability of Rice-husk and Saw-dust as a Cold Storage Insulation. These bulletins provide comprehensive, step-by-step instructions on how to use the materials and techniques covered.

PB82-266289/GAA PC **A02**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digests: Painting and Finishing,
Shiva Mohan Singh, Joseph George, and Mohan Rai. 1970, 21p

Keywords: *Buildings, *Paints, Protective treatments, Finishes, Corrosion resistance, Industrial buildings, Floors, Developing country application.

This document is a compilation of 5 bulletins. These are: Painting Woodwork; Painting Non-Ferrous Metals in Buildings; Painting Ferrous Metals in Buildings; Painting of Cement Plastered Surfaces; and Industrial Floor Finishes. The bulletins provide a comprehensive, step-by-step set of instructions to accomplish each of the above projects.

PB82-858887/GAA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.

Toxicology of Vinyl Chloride and Polyvinyl Chloride. 1978-January, 1982 (Citations from the Information Retrieval, Ltd. Data Base).
Rept. for Jan 78-Jan 82.
Jan 82, 162p*

Keywords: *Chemical industry, Plastics, Metabolism, Hazards, Dust, Tissues(Biology), Industrial medicine, Quantitative analysis, *Toxic substances, Carcinogenesis, Teratogenesis.

This bibliography contains citations concerning the toxicity of vinyl chloride and vinyl chloride following short and long term exposure. The metabolism, carcinogenicity and teratogenitic potential of these substances are considered and methodology to quantitate their presence in the atmosphere (particularly from dust) and body tissues are discussed. Occupational hazards are noted. (Contains 153 citations fully indexed and includes a title list.)

PB83-100255/GAA PC **A03**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
Food Security: A Review and Synthesis with Emphasis on Asia.
Staff rept.,
Gary Enders. Aug 82, 36p AGES-820730

Keywords: *Asia, *Food supply, Policies, Consumers, Statistical analysis, Strategy, Prices.

Literature relevant to food security is reviewed and organized as a discussion of the major food security strategies available to policymakers in developing countries. To understand food security policymaking, it is essential to understand the choices among strategies and the tradeoffs among the shortrun and longrun effects of policies on consumers, producers, and taxpayers.

PB83-100339/GAA PC **A08**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Impact of Milk Supply Schemes on Rural Economy in Milk Collecton Areas of Madhavaram Milk Supply Scheme Chingleput - Tamil Nadu (Bench-Mark Survey),
H. P. Singh, B. C. Saxena, Prem Narain, and S. P. Verma. 1978, 167p

Keywords: *Milk, *Agricultural economics, *India, Surveys, Supply(Economics), Economic factors, Livestock, Income, Production, Developing country application.

With a view to develop a suitable methodology for assessing the impact of urban milk supply schemes on rural economy in the milk-shed areas, large scale sample surveys were carried out by IASRI. This report deals with the sampling plan of the survey, the estimation procedure, the results of the preliminary enumeration of households and of detailed enquiry. It also contains information on milk production and its utilization, employment pattern, economic status of the rural families, and other ancillary information relating to livestock.

PB83-100347/GAA PC **A03**/MF **A01**
Indian Adult Education Association, New Delhi.
Educational Component in Agricultural Extension Service, held at Ludhiana, April 15-17, 1976.
Seminar rept.,
S. C. Dutta. Apr 76, 36p SER-111

Keywords: *Agricultural Extension Services, *Education, *India, *Farming, Telecommunications, Mass media, Visual aids, Universities, Mobil equipment, Developing country application.

The Indian Adult Education Association organized a seminar on the Educational Component of Agricultural Extension Service at the Punjab Agricultural University in Ludhiana from April 15-17. The seminar studied the relationship of agricultural productivity with education, place of education in agricultural extension services, and communication in terms of education. It concluded that adult education could improve the lives of rural populations through extension programs.

PB83-100354/GAA PC **A03**/MF **A01**
Indian Adult Education Association, New Delhi.
Translating Concepts into Methods and Programmes: Report of the National Workshop, Calcutta, July 10-13, 1978,
S. C. Dutta, and Satyen Maitra. Jul 78, 33p SER-117

Keywords: *Project planning, Developing countries, Management planning, Surveys, Developing country application.

This book is the final report of a seminar held from July 10-13, 1978 at Calcutta. Whenever a program is launched on a national level for the benefit of the people, it is of utmost importance that preparatory work should be undertaken to clarify concepts, formulate modalities of implementation, and sharpen tools. It covers survey methods, training, materials, implementation, evaluation, and research. The report concludes that not only is a well developed infrastructure necessary for success, but full participation and committment by all involved is essential for success.

PB83-100362/GAA PC **A07**/MF **A01**
Indian Univ. Association for Continuing Education, New Delhi.
Community Service as Continuing Education. S.N.D.T. Women's University, Bombay, held on November 8-10, 1976.
Seminar rept.,
G. L. Abhyanker, L. R. Shah, Kamalini H. Bhansali, Motia Prakash, and Kalindi Randeri. Nov 76, 147p

Keywords: *Education, *Women, *India, Females, Social services, Meetings, Continuing education, Developing country application.

The report contains papers presented at a seminar on community service as continuing education held from November 8-10 and S.N.D.T. Women's University in Bombay. The papers are entitled: An Overview of Community Projects Undertaken by the Bombay University Colleges; The Role of Colleges in Continuing Education; Preparation for Continuing Education - A Guideline; Community Service as Continuing Education in Urban Areas; University's Community Project Nirmal Experiment; Experiments in Community Service through Life Long Education; Linking Up Continuing Education with Community Welfare; Continuing Education through Community Work; Setting Up a Continuing Education Unit in a College; Extension Services and Continuing Education; The Role of Universities and Colleges in Continuing Education and Community Action; Community Service Program at Spicer Memorial College through Continuing Education; Pilot Project in Agriculture for Drop-Outs of M.K. Hally, Mysore; and Interdisciplinary Center for Research and Training in Social Development.

PB83-100958/GAA PC **A08**/MF **A01**
Indian Univ. Association for Continuing Education, New Delhi.
Correspondence Education,
Rudder Dutt, P. Mallikarjunappa, Dalbir Singh, T Balasubramaniam, and D. Jeebala Rao. Oct 76, 151p

Keywords: *Education, *India, Research projects, Instructors, Developing countries, Developing country application, Correspondence study.

This report contains the papers from a seminar on Correspondence Education held from October 4-6, 1976 at the Punjabi University at Patiala, India. The papers are entitled: Need for Coordination and Control of Correspondence Education - The Role of the Proposed Open University; Role of Correspondence Courses in Developing New Dimensions in Education; The Role of Correspondence Education in Developing Countries; Correspondence Course for Teachers Education; Continuing Education for Professional Engineers through Correspondence Courses; Correspondence Education in India; Some Basic Facts about Correspondence Courses Institutes in India; Systems Approach to Contact Program in a Correspondence Education Situation; Revamping Correspondence Education; Staffing Pattern of Institutes of Correspondence Courses; The Need for Research in Correspondence Education; Need for Rationalization and Coordination of Correspondence Courses in Different Institutes; and Management Education - A New Experiment.

PB83-101311/GAA PC **A06**/MF **A01**
Mitsubishi Research Inst., Inc., Tokyo (Japan).
Global Infrastructure Fund (GIF).
Progress rept.,
Masaki Nakajima. Apr 81, 120p

Keywords: *Financial management, *Project planning, Developing countries, Foreign countries, Proposals, Economic development.

The planning and implementation of multinational public investment on a worldwide scale should be most effective as a long-range global economic policy. It could be termed a 'Global New Deal.' What is meant by multinational public investment is that which involves several countries both in the execution of projects and in the scope of the benefiting areas, and wherein the period of implementation and the size of investment exceed the scope of public investments made by a single country. Moreover, since the object of such investment would be directed at removing restraints on resources, it would also serve to eliminate latent factors causing inflation. In order to realize these projects, a $13 billion fund, tentatively named the Global Infrastructure Fund will be established with, for instance, annual contributions of $5 billion collectively from the United States, West Germany, and Japan $5 billion from the OPEC countries and $3 billion from other industrially developed nations. Such a fund will serve to finance projects with a multiplier effect on a $25 billion scale annually until the end of this century. Total expenditures on these projects should reach a level of about $500 billion. Such an amount would not be very large for expenditures on public works of worldwide dimensions, but its purpose is to carry out a pump-priming role that would arouse effective demand comparable to the military expenditures during World War II.

PB83-101527/GAA PC **A11**/MF **A01**
Assam Agricultural Univ., Jorhat (India). Directorate of Research.
Assam Agricultural University - Annual Research Report 1976-77.
H. P. Barthakur, and L. P. Upadhaya. 1980, 249p

Keywords: *Agriculture, *Soils, *Crops, *India, Research projects, Grain crops, Soybean plants, Forage legumes, Sugarbeets, Sugarcane, Tuber crops, Fiber crops, Soil properties, Citrus trees, Fertilizers, Vegetables, Salinity, Plant diseases, Weed control, Developing country application.

This report contains results of the studies in various research projects in crops and soils concerning basic technical problems of production and efficient resource use. The research activities are reported under the following areas: Cereals; Grain legumes; Soybean; Sugar crop; Potato; Forage; Fibre crops; Hill agriculture; Condiments; Water management; Plant protection; and efficient use of fertilizers.

PB83-101600/GAA PC**$25.00**
Infocom, Crawley (England).
Foreign Technology Alert- Bibliography: Plastics Technology.
Final rept. Jan 80-May 82,
Gordon Wilkinson. 1982, 32p* INFO-FT/82-08

Keywords: *Plastics, *Technology transfer, Technology, Production, Chemical properties, Physical properties, Utilization, Marketing, Synthesis(Chemistry), Molding techniques, Polymers, Manufacturing.

This document provides a systematically organized collection of abstracts from the NTIS bibliographic data base relating to plastics technology and describing work originating from countries outside the USA. A tailored search of the data base was performed and the output carefully categorized, edited and indexed. The reports range from market studies through production, properties and applications to environmental testing. Much of the technology originates from Western Europe, particularly the United Kingdom, France and West Germany. Most reports are in their native language, but some translations are available; all titles are annotated accordingly. Contents: Industry overviews; Market surveys; Plastics and polymer production (Synthetic methods, Manufacture and processing, Waste recycling); Structural investigations; Physics (Mechanical properties, Electrical properties, Other studies); Chemistry (Polymerization, Radiation studies, Plasma chemistry); Product applications (Aerospace industry, Civil engineering, Furnishing industry, Electrical engineering, Mining, Medical and industrial); Environmental testing. Each of the 19 sections in the book is cross-referenced; there is also an author index and useful subject index based on major descriptors. (Copyright (c) Infocom, 1982.)

PB83-101907/GAA PC **A05**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digest - General Building Aspects,
K. Damodaran, Joseph George, S. S. Rehsi, Surinder Singh, and G. C. Sofat. 1981, 76p

Keywords: *Buildings, *Construction, Doors, Concretes, Fly ash, Water heaters, Solar heating, Particle board, Plastic pipes, Furniture, Developing country application, Energy conservation.

This document is a compilation of 13 bulletins. These are: Flush Doors; Woos Seasoning; Proportioning of Fly Ash Concrete Mix; The Yield of Mortar and Concrete Mix; Solar Water Heater - Domestic Type; Units for Living; Plastics and their Applications in Buildings; Hardboard and Particle Board; Woodwool Board; Material Constants in Building Works; Check-list for Taking Over Newly Constructed Buildings; Some Typical Enquiries and their Replies; and Energy Conservation in Buildings. These bulletins provide a comprehensive, step-by-step set of instructions on how to make and use the materials and techniques covered. Wood preservation and termite and rodent resistance of plastic pipes is also covered.

PB83-101923/GAA PC **A03**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Material Notes (CBRI),
S. S. Rehsi, Mohan Rai, R. S. Strivastava, C. A. Taneja, and V. V. Sasidaran. 1980, 46p

Keywords: *Buildings, *Construction, *Building materials, Cements, Fly ash, Structural clay products, Particle boards, Plastic pipes, Ceramic tiles, Developing country application.

This document is a compilation of 15 building materials notes. They are: Use of Coal Ash in the Building Industry; Use of Fly Ash as Pozzolana; Production of Cement Clinker Using Fly Ash; Magnesium Oxychloride Cement (Sorel Cement); Milled Granulated Slag - A Cement Saver; Non-Erodable Hiramji Wash; Coconut Pith Cement Concrete for Thermal Insulation; Mangalore Pattern Clay Roofing Tiles from Alluvial Soils; Structural Clay Products; Clay Flooring and Terracing Tiles from Alluvial Soils; Autoclaved Calcium Silicate (Sand-Lime) Bricks; Particle Board and its Use in Buildings; Woodwool Board; Unplasticized PVC Pipes for Water Supply in Buildings; Building Material from Lime Kiln Rejects. The notes cover the production and use of the materials covered.

PB83-101949/GAA PC **A03**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digest - Prefabrication,
S. C. Chakrabarti, N. C. Majumdar, Salek Chandra, V. K. Jain, and J. S. Sharma. 1981, 32p

Keywords: *Construction, *Houses, Structural design, Reinforced concrete, Precast concrete, Concrete slabs, Structural clay products, Structural timber, Structural steels, Developing country application.

This document is a compilation of 5 bulletins. These are: Prefabricated Floor/Roof Using Structural Clay Units (Panel Types, Joist & Filler Schemes); Precast Cellular Units for Floors & Roofs; Prefabricated Steel Hut; and Prefabricated Timber Hut. These bulletins provide comprehensive step-by-step instructions on how to use the materials and techniques described.

PB83-102202/GAA PC **A18**/MF **A01**
Midwest Research Inst., Kansas City, MO.
Sociotechnical Survey of Guayule Rubber Commercialization.
State-of-the art rept.,
Kennith E. Foster, William G. McGinnies, Jonathan G. Taylor, Jean L. Mills, and Suzanne J. Alexander. Apr 79, 416p NSF/PRA-7811632
Grant NSF-PRA78-11632
Prepared in cooperation with Arizona Univ., Tucson. Office of Arid Lands Studies.

Keywords: *Guayule, *Agricultural economics, *Technology assessment, Forecasting, Demand(Economics), Developing countries, Production, Climate, Soil properties, Plant reproduction, Plant genetics, Acclimatization, Planting, Harvesting, Processing, Byproducts, Marketing, Arid land, Southwestern Region(United States).

A comprehensive technology assessment is made of the commercialization in the U.S. southwest of the guayule plant as a major domestic source of rubber. The future prospects for natural rubber will determine the future for guayule. Five factors favor the commercialization of guayule: (1) There is no technical basis for the disproportionate control which synthetic rubber now has on the world elastomer market; (2) There is the likelihood that an international rubber stockpile of approximately 88 million pounds of various grades of rubber will be established, thereby stabilizing prices; (3) The potential demand in third world countries is just beginning to materialize; (4) The price comparison between natural rubber and synthetic rubber may shift in favor of natural rubber; and (5) There is potential for increasing natural rubber production to the levels required to meet much higher demand.

PB83-103291/GAA PC **A04**/MF **A01**
General Accounting Office, Washington, DC. International Div.
Federal Encouragement of Mining Investment in Developing Countries for Strategic and Critical Minerals Has Been Only Marginally Effective.
3 Sep 82, 64p GAO/ID-82-38, B-208750

Keywords: *Financial management, *Mining, *Minerals, Investments, Fixed investment, Financing, Risk, Government policies, Strategic minerals.

During the last 5 years, the United States has supported several multilateral and bilateral initiatives to encourage mining investment in developing countries as a means of both increasing global minerals supplies and assuring greater access to needed strategic and critical minerals. However, these initiatives have not resuLted in significantly increased funding for mining projects and projects supported by multilateral agencies have not sought minerals of strategic and critical importanance to the United States. Depressed minerals markets and a variety of financial, procedural, and policy-related restrictions have limited the attractiveness of these initiatives to the mining industry. Before considering any financial or operational changes, however, the U.S. Government should correct two general conditions that have impaired the effectiveness of these initiatives since their inceptions--the initiatives have not addressed mineral-specific needs and they have not been implemented as part of a coherent, well-directed, long-term investment strategy.

PB83-103341/GAA PC **A04**/MF **A01**
Helsinki Univ. of Technology, Espoo (Finland). Lab. of Information Processing Science.
Construction of Applications Oriented Data Base Management Systems,
Eero Eloranta, and Reijo Sulonen. 1979, 70p HTKK-TKO-A18, ISBN-951-751-578-2
Also pub. in ISSN-0356-5068.

Keywords: *Information systems, Real time operations, Data processing, Data management systems, Computer applications.

The authors attempt to design the internal structure of a data base management system (DBMS) suitable for a real time environment. A set of tools are provided which make the description of DBMS applications simple and straight forward.

PB83-103564/GAA PC **A05**/MF **A01**
Instituto Tecnico de Capacitacion y Productividad, Guatemala City.
Manual de Resinacion; Sistema: Pica de Corteza (Manual for Extruction of Resin Using the Bark-Peeling Technique).
Nov 79, 96p INTECAP-81-009
Text in Spanish.

Keywords: *Wood products, *Forestry, *Guatemala, Mammals, Polymers, Extraction, Bark, Peeling, Developing country application.

The technique for resin extraction shown in this manual, is the least dangerous to the tree, and helps to reduce losses in quantity and quality of the wood. It is highly recommended and easy to learn and practice, and a very rational way of preserving our woods. The text is heavily illustrated and was designed for wood industry courses and specifically for resin extracting industry workers.

PB83-103572/GAA PC **A03**/MF **A01**
Instituto Tecnico de Capacitacion y Productividad, Guatemala City.
Manual de Medicion Forestal (Forestry Mensuration Manual).
Jun 81, 44p INTECAP-81-10
Text in Spanish.

Keywords: *Guatemala, *Forestry, Manuals, Lumbering, Measurement, Forest trees, Wooden logs, Developing country application.

Those interested in measuring woods and trees will find all they need to know in this manual. Its contents include the standard neasurements of trees and woods, measuring tools, and their proper using techniques. It is designed as an aid in teaching middle level workers in forestry and logging industries.

PB83-104190/GAA PC **A04**/MF **A01**
Texas Univ. at San Antonio. Center for Studies in Business, Economics and Human Resources.
Key Business Ratios of Minority-Owned Businesses: Analysis and Policy Implications.
Final rept.,
William C. Scott, Antonio Furino, and Eugene Rodriguez, Jr. Jan 81, 74p MBDA-82-03

Keywords: *Economic analysis, Performance evaluation, *Small businesses, Income, Profits, Risks, Assets, Liabilities, Credit, Return on investment, Loans.

The purpose of this report is to orovide information about the profit, risk, and financial characteristics of minority-0wned business firms. The data base analyzed is a large financial data base created from the Balance Sheet and Income Statements of over 6,000 firms in the Dun and Bradstreet files as of 1978. The major results are (1) that minority firms not assisted by MBDA show similar profit characteristics to those of the control group. (2) Minority firms assisted by MBDA are slightly less profitable and more debt encumbered because they need more support. (3) Both minority and non-minority firms receive bank loans at about the same rate, however, loans to minority businesses are smaller than those to the control group.

PB83-104257/GAA PC **A04**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digest - Soil Engineering and Foundation.
Bulletin,
G. S. Jain, M. P. Jain, D. P. Sengupta, S. P. Sri Vastava, and S. Venkatesan. 1981, 53p

Keywords: *Buildings, *Soils, *Building materials, Construction materials, Soil properties, Pile foundations, Soil tests, Developing country application.

This document is a compilation of 9 bulletins. These are: Subsoil Deformeter for Soil Exploration; Apron - A Remedial Measure for Cracked Buildings in Expansive Soils; the Investigation of Boulder Deposits; Bored Compaction Piles; Foundations for Electrification Masts; Remedial Measures for Cracked Buildings in Expansive Soil Areas; Deep Sounding by CBRI Cone Penetration Test; Simplified Soil Boring & Sampling through Bentonite Slurry; and Pile Load Tests. The bulletins provide comprehensive step-by-step instructions on how to make use of the materials and techniques covered.

PB83-104802/GAA PC **A03**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digest - Roofing, Flooring and Construction Aspects,
P. Balakrishna Rao, Joseph George, S. K. Sharma, M. P. Jaisingh, and V. K. Jain. 1974, 42p

Keywords: *Buildings, *Construction, Construction materials, Roofs, Floors, Plastic pipes, Drainage, Reinforcing bars, Scaffolds, Developing country application.

This document is a compilation of 9 bulletins. These are: Waffle unit floor/roof; Doubly curved tile roof; Unit frame scaffolding; High strength deformed bars; Sealants for joint and cracks in buildings; Cement as a substitute for lead in jointing C.I. pipes; Friction grip joints; Single stack system of building drainage; and Plastic pipes for water supply and drainage in buildings. This booklet is a comprehensive, step-by-step guide to the proper use of these materials.

PB83-104810/GAA PC **A03**/MF **A01**
Central Inst. of Medicinal and Aromatic Plants, Lucknow (India).
Hop and Its Cultivation in India,
Tajuddin Aparbal Singh, Paltoo Ram, and Akhtar Husain. 1981, 37p FARM BULL-13

Keywords: *Plants(Botany), *India, Plant genetics, Soil properties, Plant nutrition, Harvesting, Drying, Plant diseases, Storage, Developing country application, Hop plants.

This bulletin gives details of Hop and its cultivation. The topics covered are: Botany; Cytology and Genetics; Varieties; Soil and climate; Propagation; Field operation; Establishment of a hop yard; Interculture operations, Nutrient requirements; Pruning, training, diseases and pests, Hop picking, drying, loading the kiln; and Storage.

PB83-104828/GAA PC **A02**/MF **A01**
Central Poultry Breeding Farm, Bombay (India).
Management Guide to Breeding Chickens for Laying.
1978, 20p

Keywords: *Poultry, *India, Manuals, Genetics, Animal diseases, Disease vectors, Management, Developing country application.

Central Poultry Breeding Farms Government of India, have had the unique distinction of pioneering self-reliance in the field of poultry production by evolving high producing layer chicks in India. Today, BH-78 (Bombay Hybrid-1978) the commercial layer after over 20 years of scientific research and development, ensures a yield of 260 eggs and more, with higher percentage of liveability and low feed consumption. This management guide has been produced so that a successful produce - today - and tomorrow - must utilize sound management practices to extract maximum return from the finest genetics package of BH-78 layer chicks.

PB83-105759/GAA PC **A04**/MF **A01**
Overseas Development Council, Washington, DC.
Consequences of Accelerated Mortality Declines for Future Population Growth and Economic Progress in Developing Countries: A Preliminary Exploration,
Sarah K. Brandel, and Davidson R. Gwatkin. Jan 80, 57p AID-PN-AAJ-691
Contract AID/otr-147-79-56

Keywords: *Demography, *Economic analysis, Mortality, Forecasting, Economic forecasting, Public health, Infants, Children, Fertility, Developing country application.

Must reduced mortality be achieved at the expense of future generations' economic well-being. This study of the demographic and economic impact of efforts to accelerate mortality declines in developing countries concludes that these efforts lead to a real but manageable reduction in future economic growth. Using conventional cohort-companion methods, the authors project population growth consequences for the year 2100 of increases in life expectancy 1.5 and 2 times greater than those predicted by the United Nations for the period 1975-2100. These more rapid mortality declines would lead to a global population 2-4% larger than currently predicted for the year 2000 and 6-8% larger than expected in 2100.

PB83-105767/GAA PC **A03**/MF **A01**
RAND Corp., Santa Monica, CA.
Dualism, Technical Change, and Rural Finance Markets in Developing Countries,
Farrukh Iqbal. Sep 81, 39p RAND-N-1723-AID, AID-PN-AAJ-700
Contract AID/otr-G-1822

Keywords: *Financial management, *Rural areas, *Technology transfer, Farms, *India, Credit, Competition, Developing country application.

Research to date on rural financial markets (RFM) in developing countries has failed to explain the relationship between the growing dualism of RFM's into formal (banks, cooperatives) and informal (private moneylenders) credit sources and farmers' acceptance or rejection of new farm technology. This report, based on a 1968-71 survey of 3,000 Indian farmers, examines this relationship and its implications for Indian policymakers. An overview of India's current rural credit situation reveals the growing importance of both formal credit sources and of technological change in the demand and supply of credit and the tendency for less-progressive farmers to seek credit from informal moneylenders. The determinants of informal credit interest rates are then analyzed with the help of an empirical model based on the opportunity costs of providing a loan, the administrative costs of handling a loan, and the risk factor assigned to various types of borrowers.

PB83-105775/GAA PC **A07**/MF **A01**
Idaho Univ., Moscow. Postharvest Inst. for Perishables.
Roots and Tubers: A Postharvest Bibliography.
Jul 81, 143p IC-81-01, AID-PN-AAJ-562
Contract AID-DSAN-C-0265

Keywords: *Vegetables, *Plants(Botany), *Agricultural economics, Botany, Plant diseases, Potatoes, Sugar beets, Marketing, Food storage, Harvesting, Curing, Irradiation, Drying, Developing country application, Tubers.

Idaho University's Information Center of the Postharvest Institute for Perishables (ICPIP) was created in 1980 to globally disseminate up-to-date information on reducing postharvest losses. This bibliography on roots and tubers is the first in a semiannual series of bibliographies of documents available from ICPIP. Approximately 270, mostly post-1970, predominantly English-language items are listed in five subject areas.

PB83-105783/GAA PC **A06**/MF **A01**
Research Triangle Inst., Research Triangle Park, NC.
Rural Development, Land and Human Fertility : A State-of-the-Arts Paper,
C. Shannon Stokes, Wayne A. Schutjer, Terry L. McCoy, and Charles H. Wood. Jun 79, 124p AID-PN-AAJ-555
Contract AID/ta-CA-1
Prepared in cooperation with South East Consortium for International Development.

Keywords: *Rural areas, *Fertility, *Land use, Incentives, Females, Developing country application.

Human fertility may be reduced by altering the human-to-land (HTL) relationship, widely acknowledged as a key behavioral influence in agrarian societies. This state-of-the-art report reviews existing literature on the fertility impact of the HTL relationship and on development efforts to alter the relationship. Although the data are neither extensive nor geographically balanced, several tentative conclusions emerge concerning land/fertility relationships. All evidence indicates that greater land availability increases fertility rates by encouraging marriage. Farm size also raises fertility rates, although larger families may also be a way of acquiring larger holdings. Institutional patterns regarding access to land affect fertility indirectly and either positively or negatively, e.g., land tenure programs can be combined with fertility incentives or, conversely, increase women's education and postpone their age of marriage. Data limitations prevented even tentative conclusions on the fertility effects of land distribution or land quality.

PB83-105791/GAA PC **A09**/MF **A01**
Massachusetts Inst. of Tech., Cambridge.
Nutrition - Fertility Interactions in Developing Countries: Implications for Program Design,
Marian F. Zeitlin, Nina P. Schlossman, Michael J. Meurer, Joe D. Wray, and John B. Stanbury. Jun 80, 186p AID-PN-AAJ-736
Contract AID/otr-147-79-32

Keywords: *Fertility, *Nutrition, Children, Family relations, Birth control, Developing country application.

While lowering infant mortality decreases fertility, improvements in nutrition increase fertility. It is this apparent conflict, its policy implications, and the physiological and psychological elements of the nutrition-fertility interaction which are the subject of this report. The report examines the contraceptive effects of breastfeeding; good nutrition's impact on breastfeeding (when infants receive food supplements, breastfeeding diminishes, ovulation returns, and fertility increases earlier in well-nourished women); and the effects of uncontrolled fertility on nutritional status and mortality. The report also outlines various psychosocial determinants of family size--replacement, insurance, and investment births--which must be considered in programs to reduce mortality and fertility. Any attempt to maintain a low net reproduction rate through low nutritional status will necessitate high mortality and severe deprivation and will be incompatible with those changes in personal motivation needed for voluntary adoption of the two-child family norm. Modernization entails economic constraints and changing values which combine to encourage fewer children with greater investment per child.

PB83-105809/GAA PC **A02**/MF **A01**
International Rice Research Inst., Los Banos, Laguna (Philippines).
Recent Developments in Research on Nitrogen Fertilizers for Rice.
Research paper series,
E. T. Craswell, and S. K. DeDatta. May 80, 15p IRPS-49, AID-PN-AAJ-132
Contract AID-492-1310-T

Keywords: *Fertilizers, *Rice, Nitrogen, Losses, Isotopic labeling, Vaporizing, Ammonia, Nitrification, Developing country application, Denitrification.

Asian governments and farmers, pressured by growing populations, have sought to increase rice production by using high-yield rice varieties and nitrogen fertilizers. Rice uses nitrogen fertilizers inefficiently, however, especially urea, which accounts for 85% of nitrogen fertilizers produced in Asia. This paper examines studies conducted in 11 Asian countries by the IRRI and the IFDC to determine the causes of nitrogen losses and ways to reduce them. Since these losses cannot be measured directly, a method was devised for measuring them indirectly by measuring losses in the balance of an introduced stable isotope, 15N (15N balance technique). The main nitrogen loss mechanisms were identified as ammonia volatilization and, to a lesser extent, nitrification-denitrification.

PB83-105817/GAA PC **A09**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Landlessness and Rural Poverty in Latin America: Conditions, Trends and Policies Affecting Income and Employment.
Special series on landlessness and near-landlessness,
Cheryl A. Lassen. Mar 80, 193p LNL-4, AID-PN-AAJ-645
Contract AID/ta-BMA-8

Keywords: *Rural areas, Low income groups, *Latin America, Farms, Government, Developing country application.

A major fallacy in discussing the Third World's rural poor is to depict them as an undifferentiated mass of small farmers. This report argues that while small farmers in Latin America are generally poor, the 65% of Latin America's rural population who are landless and near-landless (LNL) are destitute. To support this premise, the report outlines the dimensions, sources, and trends in Latin American rural poverty, who the LNL are, and what can be done to mitigate their hardship. The LNL--agricultural and non-agricultural rural workers, marginal and tenant farmers, and the non-sedentary poor--earn low pay, have few job opportunities, and lack assets as well as access to public goods and services. The report concludes by recommending further research in areas such as employment, seasonal migration, commercial farming, and labor laws. Country profiles are appended.

PB83-105833/GAA PC **A06**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Local Institutions and People's Participation in Rural Public Works in Nepal.
Special series on rural local organization,
Prachanda P. Pradhan. Apr 80, 111p RLO-4, AID-PN-AAJ-643
Contract AID/ta-BMA-8

Prepared in cooperation with Tribhuvan Univ., Kathmandu, Nepal.

Keywords: *Rural areas, *Technology transfer, *Nepal, Local government, Citizen participation, Suspension bridges, Coordination, Technology, Manpower, Development, Developing countries, Developing country application.

Local participation through local institutions is the key to the future of rural development in Nepal. Nepal's sociopolitical history is traced from its unification under the Saha kings in 1769 to the emergence in 1951 of a constitutional form of government under which local people were promised active participation in the country's development. Government efforts to make that promise a reality are detailed. Three rural public works projects undertaken jointly by the government and local people are then analyzed: construction of the Banglung suspension bridge and of the Ilam-Charali trunk road, and efforts of the National Development Service to promote infrastructure development by mobilizing local labor and resources. The vast need for infrastructure in Nepal and the country's current financial condition clearly shows the importance of such extensive contributions.

PB83-105874/GAA PC **A08**/MF **A01**
African Bibliographic Center, Washington, DC.
Rural Development in Botswana: A Selected Bibliography, 1966-1980,
Shirley Fischer Eicher. 1981, 156p AID-PN-AAJ-699
Contract AID/afr-C-1538

Keywords: *Rural areas, *Economic development, *Social change, Development, *Botswana, Developing country application.

A tool intended to assist researchers, teachers, government officials, and rural development personnel working in Botswana, this annotated, 1,280-item bibliography (1966-80, i.e., since independence), was prepared by the Southern Africa Development Information/Documentation Exchange (SADEX) project team in partial fulfillment of its purpose to provide a development information network for rural development in Southern Africa. Publications are grouped according to the following categories: general and reference; agriculture; development; education and training; employment, labor, and migration; geography, natural resources, and ecology; health and nutrition; housing; industry, commerce, and mining; land tenure and use; livestock; marketing, cooperatives, and credit; politics and government; society and culture; transport and communications; urbanization; and women in development.

PB83-105882/GAA PC **A09**/MF **A01**
Hawaii Inst. of Tropical Agriculture and Human Resources, Honolulu.
Experimental Designs for Predicting Crop Productivity with Environmental and Economic Inputs for Agrotechnology Transfer,
James A. Silva. 1981, 183p DEPARTMENTAL PAPER-49, AID-PN-AAJ-558
Contract AID/ta-C-1108
Color illustrations reproduced in black and white.

Keywords: *Crops, *Farming, *Tropical regions, Soil classification, Mathematical models, Yield, Soil tests, Nitrogen, Phosphorus, Potassium, Irrigation, Fertilizers, Experimental design, Japan, Developing country application.

A.I.D.'s Benchmark Soils Project (BSP) was developed to help developing tropical countries improve basic food crop production through a soil classification system and the transfer of successful agrotechnology. The first section explains BSP's objectives and its use of the U.S. Soil Taxonomy System to classify the soils tested in BSP experiments. The main objectives of the experiments were to prove the transferability of crops raised in similar soils and to develop a universal equation describing yield response for any one soil given appropriate variables. Papers in the second section describe approaches to, and results from, BSP field experiments. The third section includes descriptions of experimental designs suitable for soil fertility experiments. Prediction equations and other mathematical models for estimating optimal inputs and outputs are discussed and recommendations are made.

PB83-105916/GAA PC **A05**/MF **A01**
Agency for International Development, Washington, DC.
Nutritional Consequences of Rural-Urban Migration,
Teresa Graedon. Dec 80, 85p AID-PN-AAJ-694

Keywords: *Migration, *Nutrition, Urban areas, Rural areas, Income, Employment, Developing country application.

Available data indicate that rural-urban migrants in developing countries enjoy a nutritional status as good as, if not better, than those they left behind. In examining the consequences of internal migration on nutrition, this study considers the major factors contributing to migration, the linkages between migration and nutritional status, and some resulting policy implications. People migrate from rural areas to the cities mainly for economic reasons such as higher wages and better job potential, although urban family ties and better education and health facilities are also factors. Linkages between migration and nutritional status generally stem from major lifestyle changes involved in migrating. Among migrants, the major changes affecting their nutritional status involve the availability of jobs and the average wage rate in the city, the woman's position as wage earner and/or mother (assuming a traditional family migrated as a unit), the availability of food in the city, and the migrant's general state of health. Appended are a 72-item reference list (1961-80) and several hypothetical scenarios illustrating the migration-nutrition relation.

PB83-105924/GAA PC **A03**/MF **A01**
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
Political Economy of Bolivian Agricultural Credit,
Jerry R. Ladman, and Ronald L. Tinnermeier. Apr 79, 34p AID-PN-AAJ-916
Grant AID/ta-BMA-7
Presented at the Latin American Studies Meetings held at Pittsburgh, Pennsylvania on April 5-7, 1979. Prepared in cooperation with Colorado State Univ., Fort Collins.

Keywords: *Agricultural economics, *Bolivia, Banking business, Credit, Farms, Personnel, Foreign aid, Interest, Liabilities, Developing country application, Loans, Default debtors.

Although developing country governments ostensibly provide agricultural credit for purely economic purposes, they also do so for political reasons that may influence economic performance. To substantiate this view, this paper explains the structure of developing country credit programs and presents supporting evidence from Bolivia. Developing country governments typically control formal credit by creating public agricultural development banks or by establishing private credit portfolio requirements. Money is lent to farmers at concessionary terms to compensate for structural injustices, such as low crop prices, inherent agricultural risks, and the paucity of rural infrastructure. Repayment schedules are often lax, allowing long-term delinquency and default. This policy results in substantial transfers of income from taxpayers and savers to rural borrowers, thus giving government officials significant political leverage over agricultural land holders and credit seekers.

PB83-105932/GAA PC **A04**/MF **A01**
Academy for Educational Development, Inc., Washington, DC.
Two-Way Radio for Rural Health Care: An Overview,
Douglas Goldschmidt, Heather E. Hudson, and Wilma Lynn. May 80, 65p AID-PN-AAJ-901
Contract AID/ta-C-1473

Keywords: *Health, *Rural areas, *Communication, Radio equipment, Costs, Patients, Paraprofessional personnel, Developing country application, Health care delivery systems.

Increasing attention is being devoted to developing innovative ways of extending health care to rural areas. Toward this end, two-way radio is an effective tool which embodies technology appropriate to rural needs, is easy to maintain and use, and is relatively inexpensive. Based on developed and developing country experience, this report outlines the operation, uses, and possible problems of applying two-way radio to rural health care delivery. Experience has shown two-way radio to be most useful in medical consultation, referral, and administration; coordinating patient transport; providing continuing education to rural health workers; relaying non-health messages; and responding to disasters. A radio systems' actual use, however, will depend on the design of both the health care system and the radio network, the health workers' training and degree of isolation, and the type of assistance available by radio.

PB83-105940/GAA PC **A05**/MF **A01**
Agency for International Development, Washington, DC.
Korean Potable Water System Project: Lessons from Experience.
Project impact evaluation rept. no. 20,
Eric Chetwynd, Jr., Daniel M. Dworkin, and Son Ung Kim. May 81, 100p AID-PN-AAJ-170

Keywords: *Potable water, *South Korea, *Water supply, Communities, Interviews, Evaluation, Diseases, Public health, Water distribution, Management, Availability, Developing country application, Lessons learned.

To address the potable water needs of semiurban communities (population 5,000-10,000) overlooked by rural and urban development projects, A.I.D. joined CARE in 1977 to sponsor a piped water system (PWS) project for six South Korean communities. This report, based on interviews with PWS operators and users, evaluates the project's impact and lessons for the future.

PB83-105957/GAA PC **A05**/MF **A01**
Agency for International Development, Washington, DC.
Economics of Village-Level Forestry: A Methodological Framework.
Final rept.,
Asif Shaikh, and Patricia Larson. 1981, 79p AID-PN-AAJ-431

Keywords: *Economic analysis, *Forestry, Investments, Decision making, Output, Comparison, Deforestation, Energy development.

Many of the small-scale, decentralized energy projects intended to meet the developing world's deepening deforestation crisis lack a thorough economic analysis at the design stage and consequently are economically unsound. This report enunciates an economic methodological framework for energy project formulation and development, broadening the traditional tools of cost/benefit analysis to fit the complexities of village-level forestry programs. The author accordingly considers the project's investment and benefit levels, distribution of incentives and decision-making, allocation of burdens and outputs, especially as pertaining to individual evaluations of the risk of project participation.

PB83-105965/GAA PC **A03**/MF **A01**
Agency for International Development, Washington, DC.
'Leucaena leucocephala': An Excellent Feed for Livestock.
Technical series bulletin,
Michael D. Benge. Sep 80, 31p AID-PN-AAJ-152, TSB-25

Keywords: *Leguminous plants, *Animal feeds, *Tropical regions, Nutritive value, Tolerances(Physiology), Droughts, Vitamins, Proteins, Pasture, Fertilizers, Planting, Plant reproduction, Erosion control, Central America, Developing country application, *Leucaena leucocephala.

Leucaena leucocephala, a leguminous tree native to Central America, is extremely well-suited to the seasonally dry tropics. It can be fed fresh, or as leaf meal, silage, or browse to cows, goats, chickens, and a variety of fish. This report describes characteristics, uses, and planting procedures for LL. Leucaena's many varieties.

PB83-105973/GAA PC **A03**/MF **A01**
Minnesota Univ., St. Paul. Dept. of Agricultural and Applied Economics.
Capturing the Economic Surplus Created by Irrigation.
Staff paper,

K. William Easter. Jul 80, 27p P80-14, AID-PN-AAJ-926
Contract AID/NE-C-1507

Keywords: *Water supply, *Irrigation, Policies, Revenue, Rates(Costs), Water consumption, Taxes, Economic factors, Allocations, Developing country application.

Irrigation projects, once economic assets to developing countries, are now financial burdens that draw on general revenues to pay rising construction, maintenance, and operating costs. This report concludes that irrigation projects should net an economic surplus as long as planners use a price-flexible design responsive to regional irrigation needs and governmental revenue requirements. The report first describes the two goals of irrigation pricing policy, namely, to recover operating costs and to control water allocation. Next, the six types of water charges are examined. Volumetric charges are suited to countries where water is scarce and allocation must be efficient.

PB83-105981/GAA PC **A03**/MF **A01**
Minnesota Univ., St. Paul. Dept. of Agricultural and Applied Economics.
Wheat, Allocative Error and Risk: Northern Tunisia,
Terry Roe, and David Nygaard. 1980, 29p BULL-V, AID-PN-AAJ-018
Grant AID/DSAN-XII-G-0012

Keywords: *Productivity, *Wheat, *Agricultural economics, *Tunisia, Risk, Allocations, Yield, Errors, Comparison, Planting, Land use, Developing country application.

Although often considered constraints to both greater productivity and the adoption of new technologies, the total impact of risk, uncertainty, and resource misallocation on agricultural production has yet to be empirically established. This study analyzes how farmers' knowledge and perception of risk affects resource allocation in the production of ordinary and high-yield varieties (HYV's) of wheat. Two different production functions--one linking expected with actual yield and the other relating actual yield and inputs--were fitted to data gathered from 125 Northern Tunisian wheat farmers during the 1976-77 crop year. The authors then compared the two functions in order to quantify and explain errors in resource allocation and to analyze the impact of these errors on yield and land area planted in HYV's.

PB83-106005/GAA PC **A08**/MF **A01**
National Fertilizer Development Center, Muscle Shoals, AL.
U.S. Fertilizer Technology Patents,
Jane J. Mackey. 1979, 164p AID-PN-AAJ-559

Keywords: *Fertilizers, *Industrial Development, Industries, Nitrogen, Phosphorus, Phosphoric acids, Inorganic phosphates, Potassium, Processing, Sulfur, Sulfuric acid, Mixtures, Trace elements, Ammonium compounds, Nitrogen fixation, Nitrification, Mining, Materials handling, Urea, Controlled release fertilizers, Developing country application.

Fertilizer patents issued in the United States provide much of the technology used in the fertilizer industry worldwide. This report contains 1,014 abstracts of selected U.S. patents previously published in the NFDC's monthly journal, Fertilizer Abstracts, between 1968 and 1978. The abstracts, representing those U.S. patents and U.S. equivalents of previously issued foreign patents deemed most pertinent to today's fertilizer industry. The first section is on nitrogen fertilizer processes. The section on phosphorus fertilizer processes is the largest, due to the vast amount of research done on wet process acid in recent years, and covers such topics as the mining, handling, and processing of phosphate rock. Regarding the potassium fertilizer industry, potassium recovery, handling, and processing and potassium compounds are covered. Other, smaller sections discuss sulfur and sulfuric acid in the fertilizer industry.

PB83-106013/GAA PC **E07**/MF **E07**
Paint Research Association, Teddington (England).
Paint Industry Today: World Trends,
K. Halpin. Jan 80, 116p*

Keywords: *Paints, *International trade, Imports, Exports, Production, Technology innovation, Consumption, Demand(Economics), Economic analysis, Translations, Industrial structure.

The article surveys the paint industry in all countries for which it has been possible to obtain information. These comprise countries of the Far East, including the People's Republic of China, of the Near and Middle East, Brazil, countries of Africa and Oceania, and of Eastern and Western Europe. This article will be invaluable to anyone with an interest in international trade, or anyone who wishes to know which countries import most of their paint, which have their own paint industry, and which are the competing exporters.

PB83-106286/GAA PC **A02**/MF **A01**
Office of Human Development Services, Washington, DC.
Familias Con Solo Uno de Los Padres (One Parent Families).
1974, 16p DHEW/PUB/OHD-74-64
Text in Spanish.

Keywords: *Children, Family relations, Interpersonal relations, Case histories.

The report gives advice to help the thousands of men and women who are raising their children without the other parent. It presents case histories of one parent families who made it.

PB83-106476/GAA PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Program Analysis Div.
Analysis of Fiscal and Monetary Policies.
31 Aug 82, 99p GAO/PAD-82-45, B-208549

Keywords: Expenses, *Financial management, National government, Federal budgets, Federal Reserve System.

The U.S. economy is in its eighth recession since the Second World War. GAO analyzes fiscal and monetary policies and their contribution to the current recession. GAO's analysis concludes that any approach to revamping economic policy be built around the following principles: Economic policy should be based on a long-run objective of moderating inflation while stimulating economic investment. Adjustments in economic policy should be gradual and moderate. Fiscal and monetary policies should be based on consistent long-run employment, price level, and economic growth goals that are achievable. Overall, a marginal easing of monetary policy and a substantial reduction in future budget deficits seem appropriate policy actions.

PB83-106484/GAA PC **A05**/MF **A01**
Transportation Research Board, Washington, DC.
Transportation Technology Support for Developing Countries. Synthesis 3: Labor-Based Construction and Maintenance of Low-Volume Roads.
1981, 76p AID-PN-AAJ-720
Contract AID/otr-C-1591

Keywords: *Roads, *Construction, *Maintenance, Developing countries, Rural areas, Technology, Low volume roads, Developing country application.

One major deficiency in many developing countries' transport systems is the lack of low-volume roads that generally carry only 5-10 vehicles a day but provide some rural areas with their only link to markets and public service facilities. This report, available in English, French, and Spanish, is part of an AID-funded project to improve developing country access to existing information on the planning, design, construction, and maintenance of low-volume roads. This report's specific purpose is to synthesize--mainly for policymakers in the transportation ministry, planners of road programs and chief engineers in the road authority--existing literature on the meaning, concerns, and use of labor-based technologies in low-volume road construction and maintenance in the context of development. A wide range of labor-and equipment-based construction tools and methods (from hoes, picks, crowbars, and wheel-barrows to bulldozers and mechanized excavators and loaders) are discussed because no construction technology is entirely labor-based but instead spans a full spectrum of human, animal, and mechanical resource combinations. A general evaluation framework is presented to assist policymakers in choosing an appropriate mix of construction technologies which is technically, financially, socially, and economically feasible.

PB83-106492/GAA PC **A02**/MF **A01**
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
Lending to Rural Poor Through Informal Groups: A Promising Financial Market Innovation.
Occasional paper,
Dale W. Adams, and Jerry R. Ladman. 13 Mar 79, 10p OP-587, AID-PN-AAJ-899
Contract AID/ta-BMA-7

Keywords: *Financial management, *Rural areas, Credit, Loans, Developing country application.

Informal group lending is a recent innovation introduced to increase the rural poor's share of agricultural credit in developing countries. To help determine the value of this innovation, this paper examines five advantages claimed for group lending.

PB83-106500/GAA PC **A04**/MF **A01**
Agency for International Development, Abidjan (Ivory Coast). Regional Economic Development Services Office, West Africa.
Economic and Social Development in West Africa.
Aug 79, 75p AID-PN-AAJ-924

Keywords: *Economic development, *Social change, *West Africa, Quality of life, Populations, Agriculture, Commerce, Gross National Product, Rural areas, Females, Housing, Environments, Energy, Health, Developing country application.

West Africa, extending from Cape Verde to Zaire, includes 22 countries with a total land mass larger than that of the United States, but with a smaller population (190 million) and a GNP only as large as Switzerland's ($63 billion). This report provides a brief overview of development in West Africa (in terms of demography, quality of life, agriculture, economic growth and income distribution, trade, debt service, and foreign assistance) and discusses areas of development assistance. Although most of the region's labor force is engaged in agriculture, population increases have outpaced increases in food staple production. This, combined with drought, cattle disease, inadequate agricultural infrastructure, and a shortage of trained manpower, has increased West Africa's food dependency. Also discussed are needs and A.I.D. strategies in regard to livestock, rural development, food aid, transport, river basins, health, nutrition, women, human resources, population, housing, environment, and energy.

PB83-106518/GAA PC **A06**/MF **A01**
Urban Resources Consultants, Inc., Washington, DC.
Transfer of Technology to Water Supply, Sanitation, and Waste Disposal Systems in Developing Countries.
Dec 79, 118p AID-PN-AAH-478
Contract AID/otr-C-0015

Keywords: *Sewage disposal, *Water supply, *Sanitation, *Technology transfer, Government policies, Rural areas, Water wells, Standards, Construction, Water conservation, Diseases, Public health, Methane, Feces, Waste water reuse, Aquaculture, Economic factors, Developing country application, Biogas.

More than half the world's people have no reliable and safe water supply, while 70-80% have no sewage disposal. To help decisionmakers develop feasible options to improve these dreadful conditions, which are responsible for 80% of all illnesses in the Third World and are the major cause of infant mortality, this paper, one of a series of state-of-the-art reports, reviews the possibilities for improving developing country water supply, sanitation, and waste disposal (WS/S/WD) systems through the transfer of technology.

PB83-106526/GAA PC **A03**/MF **A01**
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
Agricultural Credit and Rural Progress in Jamaica: A Development Dilemma.
Occasional paper,
Douglas H. Graham, and Compton Bourne. 12 Jun 79, 41p OP-633, AID-PN-AAH-882
Contract AID/ta-BMA-7

Keywords: *Jamaica, *Agricultural economics, *Economic development, *Rural areas, Financing, Financial services, Developing country application.

Jamaica's use of agricultural credit in the past decade exemplifies a classic conflict between bankers and development planners. In describing the conflict, this report examines and evaluates Jamaica's: (1) economic stagnation since the early 1970's (after a short period of reasonable growth) and the effect of this decline on the financial sector; (2) national credit systems' growth, institutional features, and aggregrate performance; and (3) public and commercial credit institutions and programs.

PB83-106534/GAA PC **A08**/MF **A01**
Food and Nutrition Service, Washington, DC.
Nutrition Impacts of Livestock Developments Schemes among Pastoral Peoples,
Joel Mathless Teitelbaum. Nov 80, 169p AID-PN-AAJ-693

Keywords: *Nutrition, *Livestock, *Grains(Food), Diets, Dairy products, Milk, Humans, Arid land, Food consumption, *Africa, Developing country application, Sahel.

In many instances, livestock projects have wrought, albeit unintentionally, adverse effects on the food supply and way of life of nomadic peoples. This report discusses the traditional diet and way of life of the pastoralists and examines the impact on these of livestock development strategies. Rather than relying on their herds for food, pastoralists derive the greater part of their diets from cereals (millet, barley, maize, sorghum, etc.). However, milk-based foods provided by the herds do play a critical part in their diet and health by enhancing the lower protein content of their starchy cereal staples and, as suggested by some researchers, by providing protection against malaria and other diseases.

PB83-106542/GAA PC **A08**/MF **A01**
Overseas Development Council, Washington, DC.
Assistance to the Third World on Urban Energy,
James W. Howe, and James J. Tarrant. 19 May 80, 168p AID-PN-AAJ-101
Contract AID/DSAN-G-0142

Keywords: *Energy, *Urban planning, *Urbanization, Foreign aid, Energy policy, Developing country application.

Since increased urbanization usually entails increased energy use, the 5-10% growth rate of developing country urban areas has ominous implications for these countries' future energy needs. This report assesses major urban energy uses and problems and recommends strategies and a methodology for A.I.D. assistance in helping to meet these needs.

PB83-106617/GAA PC **A03**/MF **A01**
Natural Resources Defense Council, Inc., Washington, DC. International Project.
Preliminary Guide to Audiovisual Materials on Environmental and Natural Resource Issues in Developing Countries.
1980, 45p AID-PN-AAH-019

Keywords: *Environmental management, Films, Wildlife, Deserts, Lakes, *Natural resources, Developing country application.

This guide, compiled by the Natural Resources Defense Council, includes references to 84 audiovisual materials suitable for use in programs which address the relationship between the environment and natural resources and development. In compiling this guide, requests for information about such materials were sent to over 100 government agencies, academic institutions, environmental organizations, and commercial film distributors in the United States and abroad. The items listed in the guide were chosen on the basis of whether they discussed and/or illustrated: (1) the effects of economic development upon the human environment; (2) the impacts of natural resource degradation upon human well-being; or (3) an approach to the protection and management of natural resources. Consideration was also given to whether the material considered such issues in a developing country setting or in a context relevant to A.I.D. and developing country concerns.

PB83-106625/GAA PC **A05**/MF **A01**
Michigan Univ., Ann Arbor. Center for Research on Economic Development.
Analysis of Grain Storage in Three Interior Sahel Countries,
Annette M. Pinckney. Jan 79, 78p Discussion Paper-75, AID-PN-AAG-167
Contract AID/afr-C-1143

Keywords: *Sahel, *Grains(Food), *Food storage, *Subsaharan Africa, Marketing, Warehouses, Volume, Cargo transportation, Mali, Niger, Upper Volta, Developing country application.

Marketing expected increases in foodgrain production will require viable grain storage systems in Mali, Niger, and Upper Volta. This report analyzes current grain storage systems in the three Sahelian countries and raises key policy issues. In Mali, domestic grain is transported to an arrondissement and then to provincial storage centers whose estimated national capacity is 130,000 metric tons (MT). The State Marketing Board, OPAM, transfers 8% of all millet and 30% of rice to widely used central warehouses. While this system saves money, the lack of decentralized warehousing increases transport burdens on suppliers and leads to an unquantified loss of grain in shipping.

PB83-106633/GAA PC **A03**/MF **A01**
International Rice Research Inst., Los Banos, Laguna (Philippines).
Quality Characteristics of Milled Rice Grown in Different Countries.
Research paper series,
B. O. Juliano, and C. G. Pascual. Mar 80, 28p IRPS-48, AID-PN-AAJ-129
Contract AID-492-1310-T

Keywords: *Rice, *Proteins, Texture, Hardness, Amyloses, Gelation, Food chemistry, *Philippines, Developing country application.

Next to yield, grain quality is the major objective of rice breeding programs. This report describes the quality characteristics of milled rice as assessed by IRRI's Chemistry Department since 1962. Rice samples were obtained from government rice breeding programs in 41 countries and analyzed for protein content, amylose content, alkali spreading value (gelatinization temperature index), gel consistency, amylograph viscosity (changes in paste viscosity of cooked rice flour), and cooked rice Instron hardness and stickiness. Statistical analysis yielded linear correlation coefficients that indicate amylose content is the major determinent of the texture of cooked rice.

PB83-106641/GAA PC **A03**/MF **A01**
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
Structure and Performance of Rural Financial Markets in the Philippines.
Occasional paper,
Cristina David. 17 May 79, 41p OP-589, AID-PN-AAJ-898
Contract AID/ta-BMA-7

Keywords: *Philippines, *Agriculture, *Farming, *Financial management, Financing, Rural areas, Farms, Income, Productivity, Loans, Developing country application.

Small farm production in developing countries often depends on the ability of rural financial markets to provide farmers with access to credit. This paper examines the structure and performance of such markets, especially supervised credit programs (SCP), in the Philippines in terms of credit delivery, loan repayment, and impact on farm productivity and income.

PB83-106658/GAA PC **A05**/MF **A01**
Agency for International Development, Washington, DC.
Potential for Renewable Energy Technologies in the Rural Postharvest Food System in Developing Countries,
Carl J. Lindblad. Apr 81, 100p AID-PN-AAJ-629

Keywords: *Grains(Food), *Food processing, *Crops, *Renewable energy, Drying, Food storage, Canneries, Cookery, Fuels, Wood, Solar energy, Ovens, Crop driers, Farm storage, Windmills, Photovoltaic cells, Alcohols, Developing country application, Solar cookers, Biogas.

This report examines energy demand and potential renewable energy technologies for postharvest food processing with particular emphasis on technologies related to grain. Postharvest activities (harvesting, drying, threshing, winnowing, shelling, hulling, grinding, storage, refrigeration, canning, cooking) and the techniques used in these activities are explored. Possible renewable sources include fuelwood, charcoal, solar cookers, ovens, and crop dryers, photovoltaics, animal draft, pedal power, wind power, hydropower, biogas, and alcohol fuels; some of these, it is noted, also have potential applicability beyond postharvest activities.

PB83-106666/GAA PC **A05**/MF **A01**
Agency for International Development, Washington, DC.
Incentives, Fertility Behavior, and Integrated Community Development: An Overview,
Henry P. David. Jan 80, 77p AID-PN-AAJ-808

Keywords: *Birth control, *Population control, Policies, Population growth, *Fertility, Legislation, Quality of life, Developing country application.

Developing country population policies are often reinforced with incentives to reward those who limit the number of births. The range of incentives used in Bangladesh, China, India, Indonesia, Korea, the Philippines, Singapore, Sri Lanka, Taiwan, Thailand, and regions of Africa and Asia are reviewed in this paper. Both financial incentives (e.g., cash, preference in housing and land assignments, additional pensions and medical care) and disincentives (e.g., salary deductions) are utilized. A review of pertinent literature indicates that the use of incentives and disincentives to control population growth, if implemented in a balanced, non-discriminatory way, is not incompatible with human rights policies. Illustrating this point, Thailand's Planned Parenthood Association has pioneered an imaginative and successful community-based family planning (FP) service program (CBFPS) which has evolved into a broader program integrating FP initiatives into a broad range of community development projects.

PB83-106674/GAA PC **A19**/MF **A01**
Michigan Univ., Ann Arbor. Center for Research on Economic Development.
Livestock Versus Food Grain Production in Southeast Upper Volta: A Resource Allocation Analysis,
Christopher L. Delgado. Mar 79, 450p AID-PN-AAH-785
Contract AID/afr-C-1169

Keywords: *Livestock, *Farming, *Crops, *Agricultural economics, *West Africa, Farm management, Income, Cattle, Manpower, Mathematical models, Grain crops, Feeding stuffs, Developing country application, Sahel Region(Africa).

Contrary to conventional wisdom, West African Sahelian peasant farm income would not rise significantly if separate crop and livestock enterprises were integrated into a single farm operation. This report, part of a 3-year study of West African livestock economics, documents a 13-month farm management survey of 41 Mossi and Bisa farm households and a concomitant 5-month survey of 20 Fulani herdsmen in the Tenkodogo area to test the viability and income-generating capacity of integrating cattle raising into smallholder agriculture. Detailed in this report is farm-level information on labor flows, land use patterns, grain production, cattle labor requirements, and livestock ownership patterns for the 1976-77 agricultural year. A linear programming model is used to identify optimal production strategies and resource constraints.

PB83-106682/GAA PC **A03**/MF **A01**
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
Critique of Traditional Agricultural Credit Projects and Policies,
Dale W. Adams, and Douglas H. Graham. 1978, 28p AID-PN-AAJ-894
Contract AID/ta-BMA-7

Keywords: *Financial management, *Agricultural economics, *Rural areas, Policies, Credit, Developing country application, Loans.

Despite good intentions, a majority of developing countries' rural financial market (RFM) projects have generally contributed to overall resource misallocation, inequitable wealth distribution, and political sabotage.

This paper reviews common problems and erroneous assumptions associated with RFM projects, outlines new policy approaches and suggestions for making improvements, and offers explanations as to why new ideas may not be accepted by local policymakers. Many of the problems cited, such as loan repayment delinquencies, medium- and long-term formal credit unavailability, high loan transaction costs, and credit flow distortions, are due mainly to inaccurate assumptions about how RFM's operate and about the factors which determine borrower and lender behavior.

PB83-106690/GAA PC **A03**/MF **A01**
Agency for International Development, Washington, DC.
Cost of Primary Health Care,
K. C. Gaspari. Dec 80, 37p AID-PN-AAJ-692

Keywords: *Health, *Economic analysis, Estimating, Developing country application, Health economics, Health care requirements, Health services.

Estimating the cost of primary health care (PHC) for a developing country is a deceptive and complicated task, and efforts to apply benchmark estimates to specific programs can lead to misuse of health care resources. This paper addresses this problem by providing a conceptual framework for estimating PHC costs and illustrating the importance of program-specific cost projections. The key to costing out PHC is to determine the factors which contribute to costs and then to measure them accurately. The first step in factor cost determination is to define the function and scope of desired services by defining the size and specific health needs of the target population and the number of them to be affected by the proposed service. Second, costs associated with the actual services rendered to meet the PHC objective need to be determined.

PB83-106860/GAA PC **A20**/MF **A01**
Iowa State Univ., Ames. Dept. of Economics.
Economic Growth, Equity and Agricultural Development in the Dominican Republic,
Lehman B. Fletcher, and Eric Graber. 1980, 472p MONO-12, AID-PN-AAJ-133
Contract AID/ta-BMA-3

Keywords: *Agriculture, *Dominican Republic, Developing countries, Farms, Rural areas, Employment, *Economic analysis, Economic growth, Developing country application, Poverty.

Agricultural sector analysis is basic in devising strategies to improve farm production and ensure equitable growth in developing countries. This study, the twelfth in a series on Latin American and Caribbean countries, analyzes the Dominican Republic's (DR) agricultural sector and suggests priorities for a national sector development program. To achieve equitable growth for the poor an agricultural strategy designed to increase small farm output, income, employment, and nutrition is proposed.

PB83-106948/GAA PC **A17**/MF **A01**
Volunteers in Technical Assistance, Inc., Mt. Rainier, MD.
Appropriate Technology in Bolivia: Results, Recommendations and Reports; The Vita Survey of AT in Agriculture, Small Scale Industry and Artisanry, Water Supply and Sanitation and Energy.
28 Feb 80, 391p AID-PN-AAH-637
Contract AID-511-179-T

Keywords: *Energy, *Water resources, *Agriculture, *Bolivia, Surveys, Sanitation, Rural areas, Project planning, Water supply, Agricultural machinery, Harvesters, Soils, Industries, Water wells, Pumping, Windmills, Solar energy, Organizations, Developing country application, Appropriate technology, Artisanry.

The application of appropriate technology (AT) in Bolivian rural development projects has been hampered by the failure of involved institutions to coordinate their efforts. This detailed survey report, prepared by VITA, reviews the background, issues, and current status of AT in Bolivia's sectors of agriculture, rural small enterprise, sanitation, and energy; and describes the domestic and international organizations active in Bolivian AT and rural development.

PB83-106955/GAA PC **A09**/MF **A01**
PADCO, Inc., Washington, DC.
Integrated Improvement Program for the Urban Poor. An Orientation for Project Design and Implementation: Volume I.
Sep 81, 188p AID-PN-AAJ-815
Contract AID/otr-C-1627
See also PB83-106963.

Keywords: *Urban planning, *Community development, *Social services, Federal assistance programs, Project management, Personnel, Specialized training, Evaluation, Housing, Employment, Public health, Sanitation, Transportation, Developing country application.

A.I.D.'s Integrated Improvement Program for the Urban Poor (IIPUP) aims at alleviating the severe shortages in shelter and other essential areas (e.g., employment) suffered by the poor who constitute the growing majority of urbanities in developing countries. This state-of-the-art report presents guidelines for designing and implementing IIPUP projects. Fundamental assumptions of IIPUP are that assistance programs should address both the causes and consequences of urban poverty in ways that are comprehensive (to address many different needs simultaneously) and integrated (to minimize duplication and improve efficiency). Besides establishing appropriate goals and purposes, IIPUP project designs should identify beneficiaries and select those project components most likely to meet the former's needs; choose appropriate ways to integrate services in concrete circumstances; provide adequate funding and ensure continuity of financing after the initial project phase; plan for gradual project implementation in accordance with the degree of host country acceptance; and, if need be, initiate changes in existing laws.

PB83-106963/GAA PC **A06**/MF **A01**
PADCO, Inc., Washington, DC.
Integrated Improvement Program for the Urban Poor: An orienatation for Project Design and Implementation. Volume II: Annexes.
May 80, 124p AID-PN-AAJ-816
Contract AID/otr-C-1627
See also PB83-106955.

Keywords: *Urban planning, *Community development, *Social services, Federal assistance programs, Project management, Personnel, Specialized training, Evaluation, Housing, Employment, Public health, Sanitation, Transportation, Developing country application.

Rapid urban growth in developing countries has led to serious deficits in the provision of shelter and other essential goods and services to the poor who constitute the vast and growing majority of urban dwellers. To help A.I.D. alleviate the plight of these poor, a state-of-the-art report has been prepared on the design and implementation of A.I.D.'s Integrated Improvement Program for the Urban Poor (IIPUP). This companion volume contains four annexes to that report. The first annex discusses IIPUP project components--shelter provision, assistance to small-scale enterprises, other employment assistance, informal adult education, environmental sanitation, urban health services, public transportation, participant mobilization, and improvement of the welfare of the neediest groups. The second annex presents case studies form U.S. and international (India, Honduras, Zambia, Indonesia, and Kenya) experience in urban improvement projects. The third annex offers a comprehensive checklist of data requirements (demographic, social, economic, housing, health, welfare, labor, education, transportation and communications) for designing and evaluating IIPUP projects. The final annex is a 90-item bibliography (1959-80).

PB83-106971/GAA PC **A20**/MF **A01**
CH2M Hill International Corp., Gainesville, FL.
U.S.A.I.D. Desalination Manual,
O. K. Buros, Robert Bruce Cox, Isadore Nusbaum, Ali M. El-Nashar, and Robert Bakish. Aug 80, 466p AID-PN-AAJ-122
Contract AID/otr-C-1618

Keywords: *Desalination, *Water treatment, Manuals, Distillation, Freezing, Demineralizing, Electrodialysis, Potable water, Separation, Membranes, Theory, Evaporators, Sea water, Maintenance, Performance evaluation, Cost analysis, Developing country application.

As the world's population has grown, demand for fresh water has dramatically increased, straining available supplies and impeding development. Desalination, the removal of salts from water, offers an increasingly feasible and necessary solution to this problem. This manual outlines major desalination processes and evaluates their development, performance, potential, problems, and economics to give planners a better understanding of the applicability of desalting in developing countries. Four major desalination processes--distillation, freezing, reverse osmosis, and electrodialysis--are examined.

PB83-106989/GAA PC **A10**/MF **A01**
Experience, Inc., Minneapolis, MN.
Analysis of Economic Variables for the Southern Valleys of Bolivia.
Final rept.,
H. Van de Wetering. Nov 81, 224p AID-PN-AAJ-477
Contract AID/SOD/PDC-C-0219

Keywords: *Farming, *Income, *Bolivia, Developing countries, *Rural areas, Income, Employment, Economic analysis, Households, Developing country application.

As part of an AID-funded agricultural sector analysis in Bolivia, this report presents results of a 1977-80 socioeconomic survey of 699 representative farm households in Bolivia's southern valleys to determine the factors affecting farm household economic behavior. The author recommends that future studies be focused more on specific agricultural issues and that farm household livestock sectors be analyzed separately from crop sectors.

PB83-107763/GAA PC **A08**/MF **A01**
National Fertilizer Development Center, Muscle Shoals, AL.
Optimization of Biological Recycling of Plant Nutrients in Livestock Waste by Utilizing Waste Heat from Cooling Water.
Final rept. May 75-Sep 81,
J. J. Maddox, L. L. Behrends, D. W. Burch, J. B. Kingsley, and E. L. Waddell, Jr. May 82, 154p EPA-600/7-82-041

Keywords: *Agricultural wastes, *Manures, *Aquaculture, Algae, Steam electric power generation, Nutrients, Aquatic plants, Water pollution, Swine, Fertilizers, Anaerobic processes, Digestion(Decomposition), Methane, *Waste heat utilization, *Waste water reuse, Steam power plants, Biogas.

The report summarizes a 5-year study of the beneficial uses of waste heat from condenser cooling water from steam-electric generating plants. The major effort addressed the recovery of plant nutrients in swine manure by aquatic farming of selected fish and Chinese waterchestnuts. Another effort included biogas production from swine manure in an anaerobic digester and the use of the digester waste to fertilize the aquatic farming system. Optimum recovery of plant nutrients resulted from operation of an integrated fish and waterchestnut system. Flowing water systems were 30-50% more productive than static systems. Annual fish yields of 5000-7000 lb/acre are projected for a properly stocked system over a 150-180 day growing period. Similarly, waterchestnut yields of nearly 17.8 tons/acre and dry hay yields of 6.7 tons/acre from sand-bed filters would be expected when fed wastewater from the fish system. The quality of the water leaving the sand beds would meet tertiary wastewater treatment standards during the growing season. An estimated 2000-head swine facility with a $400,000 investment would annually produce a 20% rate of return, save 360,000 bbl of oil through waste heat utilization, and produce biogas equivalent to 3000 bbl of oil.

PB83-107862/GAA PC **A05**/MF **A01**
Rivkin Associates, Inc., Washington, DC.
Report on Peruvian 'Pueblos Jovenes' Problems and Possibilities for USAID IIPUP Technical Assistance,
Hortense Dicker, and Amparo Giraldo. Nov 79, 92p AID-PN-AAH-869
Contract AID/OTR-C-1636

Keywords: *Social services, *Housing, *Health, *Education, Children, Quality of life, *Peru, Urban areas, Employment, Specialized training, Organizations, Developing country application.

The residents of pueblos jovenes (low-income squatter settlements) suffer the worst effects of Peru's economic crisis and are often deprived of essential public services. This survey identifies the service needs of Lima's pueblos jovenes and recommends alternatives wherein A.I.D.'s Integrated Improvement Program for the Urban Poor (IIPUP) can provide technical assistance, training, and identify projects to upgrade service delivery. The report details the major problems faced by the pueblos jovenes in the fields of housing, health, education, child care, and community organization. Analysis is made of public and private institutions with programs that impact on the quality of life in the pueblos jovenes in order to identify resources and to suggest ways in which these institutions may be strengthened. To relieve a major constraint to the present study and in view of the transitional political situation in Peru prior to the 1980 elections, it is recommended that in FY80 IIPUP funding be used to collect data regarding: (1) typologies of the target population; (2) the sheLter sector in terms of needs, standards, access to credit, etc; (3) vocational training and employment prospects; (4) the range of private voluntary organizations; (5) health status of pueblos jovenes populations; and (6) women's socioeconomis status and needs.

PB83-107870/GAA PC **A05**/MF **A01**
California Univ., Berkeley. Inst. of International Studies.
New Light on Rural Electrification: The Evidence from Bolivia,
Judith Tendler. Sep 80, 95p R80.5, AID-PN-AAJ-030
Contract AID/DSAN-CA-0199

Keywords: *Electric power, *Rural areas, *Bolivia, Developing countries, Social effect, Economic impact, Electric utilities, Developing country application.

In 1973-74, A.I.D. financed a project to expand existing municipal electrical systems in Bolivia to seven outlying rural areas with the aim of servicing an additional 81,000 rural customers within 10 years. This report evaluates the project's impact on the rural poor in terms of three project objectives: improving the quality of life; stimulating economic production; and creating viable electric utilities.

PB83-107888/GAA PC **A02**/MF **A01**
International Rice Research Inst., Los Banos, Laguna (Philippines).
Contribution of Varietal Tolerance for Problem Soils to Yield Stability in Rice.
Research paper series,
M. Mahadevappa, H. Ikehashi, and F. N. Ponnamperuma. Dec 79, 18p IRPS-43, AID-PN-AAJ-085
Grant AID/DSAN-G-0083

Keywords: *Rice, *Soils, *Philippines, Phosphorus, Acclimatization, Zinc, Iron, Toxicity, Field tests, Developing country application.

The erratic performance of modern rice varieties in many countries has been attributed to physical and biological environmental stresses to which the plants are not adapted. This paper compares the field performance of different rice varieties in soils with common mineral stresses--phosphorus deficiency, zinc deficiency, or iron toxicity in wetland rice fields and iron deficiency in dryland rice fields. Genotypes of comparable high yield potential but different tolerance to mineral stresses were selected on the basis of greenhouse tests and tested for field performance (growth, yield, and mineral absorption) in mineral-stressed soils during the 1978 dry and wet seasons and the 1979 dry season in the Philippines.

PB83-107896/GAA PC **A02**/MF **A01**
International Rice Research Inst., Los Banos, Laguna (Philippines).
IR42: A Rice Type for Small Farmers of South and Southeast Asia.
Research paper series,
F. N. Ponnamperuma. Dec 79, 13p IRPS-44, AID-PN-AAJ-079
Grant AID/DSAN-G-0083

Keywords: *Rice, *Plants(Botany), *Southeast Asia, Hybridization, Yield, Droughts, Tolerances(Physiology), Nitrogen, Phosphorus, Zinc, Plant diseases, Insects, Salinity, Acclimatization, Developing country application.

Barely a decade after new 'miracle rices' developed during the Green Revolution prompted predictions of food self-sufficiency, developing countries are being warned that rice production is not keeping pace with population growth. This grim forecast stems from the fact that in vast areas of South and Southeast Asia, farmers have not accepted these new rice varieties. This report summarizes findings on a new rice variety, IR42, which was bred to produce stable yields in unfavorable environments.

PB83-107912/GAA PC **A05**/MF **A01**
New York State Coll. of Agriculture and Life Sciences, Ithaca.
Effects of P.L. 480 Wheat Imports on Latin American Countries.
Cornell international agriculture mimeograph,
Lana Hall. Apr 80, 93p CIAM-76, AID-PN-AAJ-038

Keywords: *Wheat, *Economic analysis, *Brazil, *Colombia, *Peru, Economic impact, Latin America, South America, Foreign aid, Food supply, Food consumption, Prices, Economic models, Agricultural economics, Developing country application.

Food aid has long been an important U.S. foreign policy tool and its popularity is likely to continue as worldwide poverty and the need to manage grain supplies in developed countries persist. However, because an increase in local grain supplies provided by food aid can depress local prices and/or lead to inadequate food production and dependence on food imports, the price and policy disincentives of food aid in recipient countries should be evaluated. This study analyzes the effects of U.S. Public Law (P.L.) 480 wheat imports on the agricultural development of Brazil, Colombia, and Peru from 1952 to 1975 and provides a basis for evaluating the effects of future food aid policy decisions. An econometric, multiequation commodity model is presented for measuring P.L. 480's effect on supply and demand for cereals, income generation, commercial grain imports, market clearing, the interrelationships of production and consumption and government policies affecting agricultural production, consumption, and trade.

PB83-108092/GAA PC **A12**/MF **A01**
Manville Service Corp., Denver, CO. Research and Development Center.
Diatomite Precoat Filtration for Pretreatment of Seawater Prior to Reverse Osmosis.
Final rept.,
G. R. Bell, and R. C. Himes. Jul 82, 260p W83-00270, , OWRT-C-90272-D(9520)(1)
Contract DI-14-34-0001-9520

Keywords: *Desalination, Cost analysis, Laboratory equipment, Pilot plants, Performance evaluation, Feasibility.

Investigation established that diatomaceous earth (DE) filtration could more consistently produce acceptable reverse osmosis feed water (based on 15-minute plugging index (PI-15) test data) than an existing central pretreatment (CPT) system over a substantial assessment period. The DE product was at or below 45 or 85% of all cycles; the CPT system was at or below 45 for only 42% of the same test days. Further, the DE product met its target PI-15 value of 40 or less, 53% of the time. Using DE to filter CPT system product gave PI values at/below 40 for 90% of 73 readings made, despite some substantial CPT system operating problems. Installed DE capital costs would be only about 40% of that for current CPT replication. Estimated operating and maintenance costs slightly favor DE over the CPT system by 14.4 to 16.3 cents/1000 gallons, respectively; addition of amortization decreases the total DE cost to only 58% that of the CPT system product. Of the DE processes evaluated, two have the capability of producing low PI-15 water. One process uses aluminum-hydrate coated DE; the other uses a separate feed of a cationic polymer, followed by DE body feed. While these products have similar PI-15 values, their other characteristics have notable differences requiring testing.

PB83-108118/GAA PC **A05**/MF **A01**
Auburn Univ., AL. Water Resources Research Inst.
Production of Reproductively Limited Grass Carp for Biological Control of Aquatic Weeds - Phase II.
Project completion rept. 1 Oct 79-31 Dec 81,
William L. Shelton. Jan 82, 77p WRRI-Bull-45, W83-00272, , OWRT-B-079-ALA(1)
Contract DI-14-34-0001-0201
See also PB80-114713.

Keywords: *Weed control, *Aquatic weeds, *Fishes, Sterilization, Hormones, Genetics, Steroids, Sex.

Use of the grass carp fish offers a useful mechanism for controlling the proliferation of nuisance aquatic plants infesting waterways, providing that unwanted reproduction of the grass carp itself could be controllable. Hence, a study was undertaken to develop a technique for producing grass carp populations with limited reproductive potential. Monosexing through hormone sex reversal was initially tried, but the specialized feeding habits of this fish complicated conventional oral treatment and necessitated an alternate method of steroid exposure. Silastic implantation containing methyltestosterone was the recommended method of hormone administration. Hence, functional sex reversal was used as a means of developing broodstock which, when bred, would yield monosex progeny. Sex-reversed males (genotypic females) were bred in 1980 and 1981; of about 500 offspring from the 1980 class that were sexed, all were females. Also, all gyno-genetic grass carp that were sexed have been females. Further evaluation of the 1980 class and sexing of 1981 class fish will be carried out. It is concluded that, if these offspring are also only female, this monosexing by breeding program can be considered for practical application for control of nuisance aquatic plant growth in waterways.

PB83-108357/GAA PC **A05**/MF **A01**
Washington Univ., Seattle. Charles W. Harris Hydraulics Lab.
Water Resource System Reliability Under Drought Conditions: The Seattle Water Supply System as a Case Study.
Technical rept. 1 Oct 78-31 Mar 81,
Sarah H. Draper, Richard N. Palmer, Dennis P. Lettenmaier, and Stephen J. Burges. Sep 81, 100p TR-72, W83-00229, , OWRT-B-080-WASH(1)
Contract DI-14-34-0001-9102

Keywords: *Drought, *Water supply, *Urban planning, Model studies, Indexes(Ratios), Water storage, Forecasting, Cedar River, Stream flow, Precipitation(Meteorology), Tolt River, Tables(Data), Washington(State), Water demand, Cedar Run Reservoir.

Several potential ways of increasing the resistance of water supply systems drought conditions through improved management/planning were examined, using the Cedar and Tolt River systems of western Washington. The use of drought indices to define/forecast hydrologic drought was assessed, particularly for the widely-used Palmer Drought Index; this index generally provided less accurate forecasts of future runoff deficiencies than hydrologic forecasting methods in current use. Simulation modeling appeared to be a more useful drought management tool. The model study illustrates the advantages of a demand-deficit approach over conventional safe yield analysis.

PB83-108605/GAA PC **A03**/MF **A01**
SRI International, Menlo Park, CA.
Development and Demonstration of a Reverse-Osmosis Energy-Recovery Device.
Final rept.,
Gerry B. Andeen, and Jeffrey C. Eid. Jun 82, 44p W83-00256, , OWRT-C-00146-D(1403)(1)
Contract DI-14-34-0001-1403

Keywords: *Desalination, Design, Performance evaluation.

An energy-recovery device for a seawater reverse-osmosis (RO) system was designed, fabricated, and tested. The device, comprised of a valving system, uses waste streams from an RO system to drive a pump which, in turn, sends additional feed flows to the RO elements. Test data demonstrated that efficiencies exceeding 95% can be expected, and, hence, energy consumption in a seawater RO desalination system can be decreased by 50%. Further, conversion may be decreased from 30% in order that membrane life is extended, and the size of the main pump and prime mover can be reduced by 50%. The device was subjected to almost 1000 hours (175,000 cycles) of testing, simulating its operation in a 4800 gallon/day seawater system, producing an outlet pressure of over 850 lbs/sq-in. for an inlet pressure of 750 lbs/sq-in.

The device demonstrated an ability to self-start and to be controlled. An analysis of value and costs suggested that the device would be available to systems as small as 10,000 gallons/day. The results of this work confirm that significant improvements in the energy and economic performance of seawater desalination systems can be achieved.

PB83-108639/GAA PC **A06**/MF **A01**
Gulf South Research Inst., New Orleans, LA.
Development of Novel Porous Substrates for Ultrafiltration, Desalination and Water Reclamation: Part III.
Final rept.,
Israel Cabasso, Thomas C. Shen, Brenda L. Zimny, and Ralph J. LeBoeuf. 13 May 82, 124p W83-00259, , OWRT-C-00151-D(0523)(1)
Contract DI-14-34-0001-0523
See also PB82-103920.

Keywords: *Desalination, Porous materials, Membranes, Ethyl cellulose, Poly(phenylene oxides).

The objective of this overall project was to develop novel porous supports which can be used to fabricate composite membranes for desalination and water reclamation by reverse osmosis. Two commercially-available polymers were integrated: poly (phenylene oxide) and ethyl cellulose. The former (PPO), chemically-modified to the desired porous support via common water coagulating techniques, was described previously. The development of the ethyl cellulose (ET) support is currently reported. Several attempts to prepare the asymmetric (salt-rejecting) membrane from ET had limited success, and was discontinued due to inferior performance and particulate contamination in the commercial grade ET polymer. The attractiveness of ET over cellulose acetate resides in its pendent ester linkages (stable over a wide pH range), much lower surface energy and hydrophilicity, and, hence, the fine porous matrix prepared from ET via phase inversion by water coagulation does not collapse on drying. A variety of porous substrates were developed and studied. Further, hollow fibers and composite desalination membranes were prepared; the latter providing information for the preparation of conventional composite membranes using the ET substrate. Membranes developed from commercial ET were macrovoid-free, having a morphology corresponding to the ultimate structure needed from such porous supports. Membrane morphologies were studied using scanning electron microscopy.

PB83-109439/GAA PC **A07**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Landless Peasants and Rural Poverty in Indonesia and the Philippines.
Special series on landlessness and near-landlessness,
Jean G. Rosenberg, and David A. Rosenberg. Feb 80, 140p LNL-3, AID-PN-AAJ-646
Grant AID/ta-BMA-8

Keywords: *Farming, *Employment, *Rural areas, *Indonesia, *Philippines, Land, Unemployment, Economic conditions, Farms, Recommendations, Government policies, Developing countries, Economic growth, Households, Land ownership, Developing country application.

The dramatic rise in the number of poor, landless peasants to 84.7% of all rural households in Indonesia and to 77.4% in the Philippines is a seemingly contradictory but direct result of economic growth and rising GNP. This paper examines how rising rates of economic output and expanding incomes are linked to pervasive unemployment and growing income disparities in these two countries. Economic discrepancies are not, however, inevitable. Government policies can reverse inequitable ownership by promoting formation of cooperatives and by shifting credit accessibility to small borrowers. The promotion of low-cost and labor-intensive technology in addition to training opportunities in new skills can significantly reduce the plight of the landless and the effects of rural poverty. Urgent action is needed, for as the range of options diminishes, the current inequitable growth process threatens political and social stability.

PB83-109447/GAA PC **A04**/MF **A01**
African Bibliographic Center, Washington, DC.
Energy Resources in Southern Africa: A Select Bibliography,
Ann Cavan. 1981, 74p ISBN-0-87859-021-8, AID-PN-AAJ-698
Contract AID/afr-C-1538

Keywords: *Subsharan Africa, *Energy source development, *Energy, Developing countries, Developing country application.

The aims, progress, and possibilities involved in Southern Africa's energy development are the subject of this 473-item bibliography. The primary items of information described in this document are relatively recent (1975-81), originate from both indigenous and international sources, and are mostly in English, although a few are in French and Portuguese. The presented information focuses on the African continent, the Southern African region, and the nations of Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, South Africa, Tanzania, Zambia, and Zimbabwe. The energy source topics include alcohol, coal, gas, oil, solar, uranium, water, wind, and wood; as well as a general energy-development category.

PB83-109546/GAA PC **A08**/MF **A01**
Indian Inst. of Tech., New Delhi.
Study of the Determination of Wheat Crop Statistics in India through the Utilisation of LANDSAT Data,
Doctoral thesis,
Manosh Kumar Munshi. 1982, 161p

Keywords: *Wheat, *India, Monitoring, Yield, Remote sensing, Production, Area, Scientific satellites, Theses, Developing country application, Landsat satellites.

The study takes into consideration the major drawbacks of the Indian crop information system and the problems of crop monitoring in the country utilizing remote sensing technology. It primarily addresses itself to developing an operational methodology for deriving wheat crop acreage statistics directly from Landsat MSS data, utilizing manual/visual techniques. Its secondary objectives are to improve the crop yield and production estimates.

PB83-109561/GAA PC **A09**/MF **A01**
Bureau of Public Enterprises, New Delhi (India).
Guidelines for Materials Management in Public Enterprises.
26 Mar 79, 186p

Keywords: *Management planning, Organizations, Resources, Inventory control, Developing countries, Developing country application.

Materials management and inventory problems are common to all organizations. Profit making manufacturing organizations were the first to recognize their importance, and more recently, the non-profit sector in the form of government agencies, hospitals, universities, etc., have also begun to realize their significance. It is not uncommon for organizations to have thousands of input materials from hundreds of suppliers. The conversion from basic raw materials to more highly processed components has made materials management a sophisticated and vital organizational function. The decade of the seventies re-established resource conservation, and its direction involved the better utilization of resources, human and material. With a view to assisting public enterprises in introducing efficient materials management, this manual was brought out. New subjects like VED analysis, matrix of confidence level, decision rules for maintenance provisioning, and control over inprocess inventories have been included.

PB83-109769/GAA PC **A03**/MF **A01**
National Inst. for Aeronautics and Systems Technology, Pretoria (South Africa).
Graphical Status Monitoring System for Project Managers,
M. P. Espenschied. Feb 81, 35p NIAST-81/07

Keywords: *Project planning, *Management planning, Cost analysis, Trends, Reliability, Project management.

A graphical project monitoring system is described, using Mechanistic and Analytical forecasting techniques to present an overall visual picture (including future trends) on project progress, to project managers. The Mechanistic technique is used when data over a period of time is reasonably linear, while the Analytical technique is required when sharp cost changes are encountered on entering a new project phase.

PB83-109983/GAA PC **A06**/MF **A01**
Hudson Inst., Croton-on-Hudson, NY.
Capital Markets Serving Small Business: Implications of the Rapid Evolution of the Financial Services Industry.
Final rept.,
Irving Leveson. Aug 82, 102p HI-3492-RR
Grant SB-2A-00064-01-0

Keywords: *Banking, Banks(Buildings), Business cycles, Financial management, *Small businesses, Organization size(Groups).

This study examines the impact of bank size on performance. Two aspects of bank performance are evaluated: (1) the effect of the business cycle, especially during periods of tight money on small versus large banks, and (2) the long-run impact of NOW accounts on the financial condition of banks. The study presents the material from a historical perspective and since the enactment of the Depository Institutions Deregulation and Monetary Control Act of 1980. The methodology includes multivariate statistical modeling using FDIC and Federal Reserve Board microdata tapes.

PB83-110742/GAA PC **A03**/MF **A01**
National Science Foundation, Washington, DC. Div. of Industrial Science and Technological Innovation.
University-Industry Cooperative Research Centers: A Practice Manual,
Louis G. Tornatzky, William A. Hetzner, J. D. Eveland, Alex Schwarzkopf, and Robert M. Colton. May 82, 40p NSF/ISI-82002

Keywords: *Technology transfer, *Training, *Education, Industries, Research projects, Technology innovation, Cost analysis, Models.

The University-Industry Cooperative Research Centers program, an institutional model for promoting collaborative research, is discussed. A Center is a university-based, typically interdisciplinary program of research supported jointly by a number of companies. The advantages of this collaborative model lie in its relatively modest financial and administrative costs. The research program of a typical Center has applications that are seen as likely to yield long-term economic benefits to participants, but because it is interdisciplinary, basic, and high risk in nature, an individual firm is unlikely to conduct a full program of such research itself. A distillation of experience from existing Centers is offered as a guide for how new Centers might be designed and structured.

PB83-111104/GAA PC **A13**/MF **A01**
Indian Inst. of Tech., New Delhi.
Finite Element Simulation of Groundwater System.
Doctoral thesis,
Raj Kishore Prasad. 1981, 292p

Keywords: *Ground water, *Water supply, Mathematical models, Aquifers, Rainfall, Steady state, Hydraulic models, Water storage, Computer programming, Graphs(Charts), Developing country application, Finite element method.

Two versatile digital models, direct and inverse, have been developed to meet the long felt need for better aquifer analysis and management. The direct model is based on finite element approximation of the governing differential equation of groundwater flow. A general purpose computer program AQUFER has been developed for this purpose. The model has two distinct features. It automatically backs out the natural flux from known steady state water table/piezometric data by solving the Poissons equation. The capability of the program has been tested by applying it to a real life complex basin in Northern India for studying a variety of management issues.

PB83-111534/GAA PC **E03**/MF **E03**
Commission of the European Communities, Luxembourg.

Report on the Activities of the Committee for Information and Documentation on Science and Technology of the European Communities (4th) (1978-80),
c1982, 40p EUR-7658-EN, ISBN-92-825-2800-5
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Keywords: *Europe, *Information systems, Documentation, Data processing, Economic development, Networks, Agreements, Data banks, Euronet-DIANE.

Achievements of the second three-year plan of action in the field of scientific and technological information and documentation (1978-80) are reviewed. During this period Euronet-DIANE was inaugurated and by the end of 1980 was providing access to 150 data banks and bases with about 1000 regular users. One of the major objectives has been to stimulate the development of a healthy and prosperous Community information market.

PB83-111575/GAA PC **E13**/MF **E13**
Commission of the European Communities, Luxembourg.
Les Obstacles a l'Innovation dans les Pays de la Communaute Europeenne (Obstacles to Innovation in the Countries of the European Community),
A. Piatier. c1981, 352p EUR-7528-FR/EN
Text in French and English.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Keywords: *Europe, Developed countries, Businesses, Government employees, *International trade, Policies.

Barriers to innovation arising from the action of public authorities have been studied with particular emphasis on those which affect medium-sized and small businesses. Investigation methods have varied from country to country: the UK, Ireland, Denmark, Belgium and Luxembourg carrying out direct surveys of firms, and Germany, the Netherlands, Italy and France giving priority to expert opinion or the results of previous research. Compatibility of the different approaches has been obtained by basing the general report on national matrix summaries. Recommendations made include financial and taxational measures, removal of bureaucratic barriers and improvement of information dissemination. Actions which could be taken at EEC level and at national level are discussed.

PB83-112706/GAA PC **A03**/MF **A01**
National Research Council, Washington, DC.
Management of the Diarrheal Diseases at the Community Level.
Final rept.
1981, 28p
Contract AID/ta-C-1428

Keywords: *Diarrhea, *Health, *Diseases, Clinical medicine, Gastrointestinal diseases, Therapy, Communities, Risk, Feeding, Benefits, Rehydration.

Community management of acute diarrheal diseases should include introduction of oral-rehydration solutions and early feeding. Currently, the WHO-recommended formula (which includes 90 meq/liter of sodium and 111 mmol/liter of glucose along with potassium and bicarbonate) is the most desirable choice. Alternative solutions, for example, using sucrose instead of glucose, with a lowered content of sodium, or without sodium or bicarbonate, may be indicated in certain situations after considering both benefits and risks. Based on still inadequately validated current concepts, continued breastfeeding of the unweaned child and early feeding of the unweaned child are desirable.

PB83-113043/GAA PC **A05**/MF **A01**
National Research Council, Washington, DC. Climate Research Board.
International Perspectives on the Study of Climate and Society: Report of the International Workshop on Climate Issues, Schloss Laxenburg, Austria, April 24-28, 1978.
Jan 79, 91p
Sponsored in part by Andrew W. Mellon Foundation, New York, and German Marshall Fund of the United States, Washington, DC.

Keywords: *Meterology, Developing countries, Economic development, Climatic changes, Cost analysis, Agriculture, Forestry, Energy, Urbanization, International relations, World Climate program, Macroeconomics.

Contents: Summary of principal conclusions and recommendations; the Climatic framework; climate, economics, and planning; Climate and the Developing Countries; Scientific priorities for International climate programs; International programs for the study of climate impacts. Annexes: A Macroeconomic approach to climate; Climate and energy planning; Climate impacts and socioeconomic conditions; How can the climatologist help the developing countries; On the scientific nature and status of the global climate problem.

PB83-113100/GAA PC **A10**/MF **A01**
Economic and Social Commission for Asia and the Pacific (UN), Bangkok (Thailand).
Migration, Urbanization, and Development in Indonesia.
Rept. no. 3,
Graeme J. Hugo, Sam Suharto, and Ananto Sigit.
1981, 218p

Keywords: *Urbanization, *Migration, Population migrations, *Indonesia, Rural areas, Urban areas, Policies, Developing country application.

This volume covers an analytical overview of the trends of urbanization, the patterns of migration, the levels of urban and rural development, and current policies which have a direct or indirect impact on population redistribution. It has used fully the available data and has drawn heavily on recent research carried out in Indonesia. The report's major sections are entitled: The urban and rural sectors in Indonesia - a comparison; population distribution and redistribution; levels, trends, and patterns of urbanization; patterns of interprovincial migration; characteristics of interprovincial migrants; and policies and programs affecting migration and urbanization in Indonesia.

PB83-113167/GAA PC **A03**/MF **A01**
Appropriate Technology Development Association, Lucknow (India).
Appropriate Techology Development Association (India) - Progress Report from September 1977 to March 1979.
Apr 79, 47p

Keywords: *Technology transfer, Rural areas, Models, Research projects, India, Developing country application.

The main objectives of the association are to promote the development of appropriate technology, specially for the weaker sections of the community and for the backward areas, the main thrust being in the direction of building up technically feasible and economically viable models by scaling up basic village technologies, scaling down large-scale manufacturing technologies, and developing suitable home living and rural community technologies and energy based on decentralized sources. This report gives the details of the progress made in 18 months. Two pilot projects, one of the decentralized Spinning Mill and the other of the Research on Mini-Sugar, were successfully completed, installed, and tests carried out. A cheap, simple and useful solar cooker was also standardized which was sent to many places for testing in field conditions. This contains survey and analytical studies, pilot projects, and research programs.

PB83-113175/GAA PC **A03**/MF **A01**
Central Inst. of Medicinal and Aromatic Plants, Lucknow (India).
Sapogenin Bearing Species of Yams and Their Cultivation in India,
Akhtar Hussain, Pratap Singh, and G. N. Srivastava.
1979, 26p FARM BULL-14

Keywords: *Potatoes, *India, Planting, Climate, Fertilizers, Irrigation, Plant diseases, Plant reproduction, Economic factors, Steroids, Glycosides, Glucose, Utilization, Developing country application, Yams, Sapogenins.

The various topics covered in this bulletin are: Botany; soil and climate; propagation; field preparation and planting, interculture, fertilizer application; irrigation; pests and diseases; harvesting, chemistry and uses, and economics of cultivation of sapogenin bearing species of yams.

PB83-113449/GAA PC **A02**/MF **A01**
Department of the Interior, Washington, DC.
IRM (Information Resources Management) Long Range Plan FY 1983-1987. Volume 1: Executive Summary.
Final rept.,
Aug 82, 13p
See also Volume 2, PB83-113456.
Also available in set of 3 reports PC E99, PB83-113431.

Keywords: *Information systems, *Natural resources, *Telecommunications, Project planning, Management analysis, Objectives, Cost analysis, Records management.

The plan lays out the roadmap and strategy for improving the Department's information resources in support of the natural resources and other assets management responsibilities of the Department. The plan is produced in three volumes. Volume I is an Executive Summary.

PB83-113456/GAA PC **A07**/MF **A01**
Department of the Interior, Washington, DC.
IRM (Information Resources Management) Long-Range Plan FY 1983-1987. Volume 2: Plan Overview and Environment.
Final rept.
Aug 82, 126p
See also Volume 1, PB83-113449, and Volume 3, PB83-113464.
Also available in set of 3 repors PC E99, PB83-113431.

Keywords: *Information systems, *Natural resources, *Telecommunications, Project planning, Management analysis, Objectives, Cost analysis, Records management.

The plan lays out the roadmap and strategy for improving the Department's information resources in support of the natural resources and other assets management responsibilities of the Department. The plan is produced in three volumes. Volume II describes the overall IRM goals and objectives, the planning process, and the planning environment.

PB83-113464/GAA PC **A14**/MF **A01**
Department of the Interior, Washington, DC.
IRM (Information Resources Management) Long Range Plan FY 1983-1987. Volume III: IRM Projects and Functional Plans.
Final rept.
Aug 82, 316p
See also Volume 2, PB83-113456.
Also available in set of 3 reports PC E99, PB83-113431.

Keywords: *Information systems, *Natural resources, *Telecommunications, Project planning, Management analysis, Objectives, Cost analysis, Records management, Personnel, Automation.

The plan lays out the roadmap and strategy for improving the Department's information resources in support of the natural resources and other assets management responsibilities of the Department. The plan is produced in three volumes. Volume III also includes Bureau estimates of personnel and dollar resources to carry out the selected projects during each of the five years in the 1983-1987 planning period.

PB83-113597/GAA PC **A09**/MF **A01**
Chicago Economic Research Associates, Inc., Evanston, IL.
Federal Regulation of Small Business.
Final rept.,
William A. Brock, and David S. Evans. 30 Aug 82, 187p*
Grant SB-1A-01-0

Keywords: *Taxes, Economic impact, Government policies, *Small businesses, Entrepreneurship, Failures(Business).

A model of business formation and dissolution to analyze the effects of Federal tax and regulatory policies on small business is presented. The model will estimate, for small business in several industries, the dynamic welfare gain from certain alternative government policies.

PB83-113662/GAA PC **A19**/MF **A01**
Corps of Engineers, Omaha, NE.
Swaziland: Water and Related Land Resources Framework Plan.
Apr 81, 431p AID-PN-AAJ-560

Keywords: *Land use, *Water resources, *Swaziland, Water supply, Rivers, Economic development, Irrigation, Social effect, Recreation, Energy, Ground water, Water consumption, Cost estimates, Dams, Water quality, South Africa, Developing country application, Water resource projects.

Large-scale irrigation and related industrial development can significantly contribute to the Government of Swaziland's (GOS) goals in the problem areas of employment, government revenue, foreign exchange, imports, and environmental degradation. This report is designed to provide a conceptual framework for future water resources development in Swaziland and to enable the GOS to effectively negotiate with its neighbors, particularly the Republic of South Africa (RSA), regarding development of international rivers. The report consists of an analysis of the impact of planned RSA water resources development on the supply and demand for water from the African rivers. The report points out that irrigation is the largest consumer of water and the key to the economic feasibility of water resources development.

PB83-113670/GAA PC **A02**/MF **A01**
Department of Meteorological Services, Salisbury (Zimbabwe).
Effect of Cloud-Seeding on Water Stress of Maize,
D. L. McNaughton, and J. C. S. Allison. 1982, 21p
Pub. in Zimbabwe Jnl. Agric. Res. 20, p39-57 1982.Prepared in cooperation with Zimbabwe Univ., Salisbury. Faculty of Agriculture.

Keywords: *Corn, *Water supply, *Zimbabwe, Rainfall, Silver iodide, Yield, Soil water, Tolerances(Physiology), Clouds(Meteorology), Temperature measurement, Tables(Data), Tests, Reprints, Developing country application.

Results of experimental cloud-seeding in Zimbabwe are summarized, and indicate that silver iodide treatment enhances rainfall if cloud-tops are colder than -10C. Higher increases result if tops are colder than -13C. By comparing distribution functions fitted to seeded and to non-seeded clouds, tentative relationships were built up between natural and seeded rainfalls. A model was developed capable of simulating a cloud-seeding season in northeast Zimbabwe, whereby 1,000 showers were distributed at random within a rectangular area, enabling total extra rainfall to be computed at every km grid-point. Less than half the area received any additional rainfall. A soil water balance routine was then used to relate the apparently increased rainfall to changes in maize yield. In approximately half of all rainy seasons in northern Zimbabwe there appears to be adequate natural rainfall such that cloud-seeding is of negligible benefit to maize.

PB83-113704/GAA PC **A19**/MF **A01**
International Center for Living Aquatic Resources Management, Manila (Philippines).
Biology and Culture of Tilapias,
R. S. V. Pullin, and R. H. Lowe-McConnell. 1982, 434p ISBN-971-04-0004-5
Also pub. in ISSN-0115-4389. Proceedings of the International Conference on the Biology and Culture of Tilapias held at Bellagio, Italy on September 2-5, 1980.

Keywords: *Fishes, *Aquaculture, Taxonomy, Animal ecology, Animal physiology, Growth, Animal diseases, Reproduction(Biology), Ponds, Genetics, Life cycles, Developing country application.

Tilapias are a major protein source in many of the developing countries, and could become a prime domesticated species for fish culture. The conference reported here was convened to bring biologists and culturists together to present reviews of existing information. The individual papers included are: Tilapias-taxonomy and specification; ecology and distribution of tilapias; life histories of tilapias-an evolutionary perspective; tilapias in fish communities; environmental physiology of tilapias; tilapia culture in ponds under controlled conditions; cage culture of tilapias; diseases of tilapiea; and genetic markers in Sarotherodon and their use for sex and species identification.

PB83-113712/GAA PC **A18**/MF **A01**
Indian Inst. of Tech., New Delhi.
Policy Study of Small Scale Industries and Government Policies with Special Reference to Chemical Industry.
Doctoral thesis,
Lata Singh. 1980, 405p

Keywords: *Chemical industry, Economic development, Industries, Foreign countries, *Small businesses, Industrial development, Developing country application.

Industrialization has been considered to be a critical component in the process of modernization, and emphasis has been laid in the developing countries on rapid industrialization. In the industrialization policy formulation of a vast agrarian economy like India, small scale industries have been assigned an important place to spread the benefits of industrialization throughout the country. There have been statements praising the achievements, and similarly statements have been made pointing to their shortcomings. However, an analytical policy study of the subject does not appear to have been carried out. The present study relates to the examination of small industries with special concern about policy and institutional issues focussing attention on the chemical industry.

PB83-113787/GAA PC **A06**/MF **A01**
Department of Agriculture, Washington, DC.
Handbook of Agriculture Charts (1982),
Debbie Ritter. Nov 82, 105p AGRICULTURE/HB-609

Keywords: *Income, *Agricultural economics, Prices, Commodities, Liabilities, Assets, Graphs(Charts), Energy, Populations, Farms, Savings, Commerce, Exports, International trade, Handbooks.

This handbook contains 291 charts depicting all significant aspects of agriculture. These charts illustrate data and complex trends for agricultural subjects ranging from farm income to consumer costs, and from commodities to energy production and use. Charts showing trade data, cost of production figures, farmland numbers, and population trends round out the agricultural picture presented in this handbook.

PB83-113795/GAA PC **A16**/MF **A01**
International Fertilizer Development Center, Muscle Shoals, AL.
Fertilizer Manual.
1979, 374p AID-PN-AAJ-093
Contract AID/ta-G-1218
Prepared in cooperation with United Nations Industrial Development Organization, Vienna (Austria).

Keywords: *Crops, *Soils, *Fertilizers, Manuals, History, Production, Farm crops, Soil fertility, Moisture, Chemical properties, Transportation, Storage, Nitrogen, Potassium, Phosphorus, Ureas, Chemical analysis, Tables(Data), Agricultural economics, Developing country application, Controlled release fertilizers.

To provide developing countries a state-of-the-art reference, the International Fertilizer Development Center prepared this manual on the history, chemistry, technology, and economics of fertilizer production. Part I details fertilizer use since the mid-19th century, reviews growth in the industry from 1950-76, and forecasts increased production and consumption as well as raw material shortages up to the year 2000. Fertilizer's impact on crops, soil, and moisture supply is examined. Part II describes the properties, production, transportation, storage, and use of nitrogen fertilizers. Part III with emphasis on the production, chemistry, and use of fertilizers derived from phosphoric and sulfuric acids and nitrophosphates. Part IV details the use of potash, compound, and controlled-release fertilizers and secondary/micro-nutrients.

PB83-113860/GAA PC **A04**/MF **A01**
InterAmerica Research Associates, Rosslyn, VA.
Evaluation of Scientific and Technical Information Distribution and Use in Latin America: The NTIS Program in Five Selected Countries,
Marina Fanning-Firfer. 1982, 62p*
Contract AID-LAC-0044-C-00-1048-00

Keywords: *Information services, *Technology transfer, *Latin America, Mexico, Costa Rica, Colombia, Peru, Dominican Republic, Program evaluation, Developing country application.

This paper evaluates the operations of the National Technical Information Service of the U.S. Department of Commerce concerning the dissemination of its information in Latin America. The study focused on five countries, Mexico, Costa Rica, Colombia, Peru, and the Dominican Republic, and interviewed a total of ninety-nine end users. The major finding of the study was that NTIS information, when accessed, contributes significantly to technological change. This report outlines the scope of work for the evaluation and the study design. The findings are detailed and the conclusions and recommendations presented. Annexes present the Pre-Test Interview Guide, a Telephone Contact Sheet, a Call Record Sheet, an Interview Guide, and Interviewer Instructions.

PB83-113951/GAA PC **A08**/MF **A01**
Indian Standards Institution, New Delhi.
Explanatory Handbook on Masonry Code.
c1981, 160p SP:20(S-T)-1981
Errata sheet inserted.

Keywords: *Buildings, *Building materials, Structural design, Mortars(Material), Bricks, Concrete blocks, Walls, Structural analysis, Developing country application.

This handbook is in two parts: Part 1 is the reproduction of Part VI Structural Design, Section 4 Masonry of the National Building Code of India 1970, and Part 2 provides commentary on various clauses of the Masonry Code. The commentary provides explanations for the background and choice of some of the requirements, draws attention to suitable references for elaboration of the code requirements, includes design aids in the form of tables and charts, gives typical illustrative examples using codal provisions, and helps in interpretations of the code. The handbook, it is hoped, would make available the needed guidance to the practicing engineers in the field of structural masonry to effect economy in cost of construction.

PB83-114017/GAA PC **A17**/MF **A01**
Science Applications, Inc., McLean, VA.
Assessment of Tsunami Hazard Presented by Possible Seismic Events: Far-Field Effects.
Final rept. Mar-Nov 81,
Gerald T. Hebenstreit. Oct 81, 384p SAI-82-599-WA, TR-424-81-216-03
Contract AID/SOD/PDC-C-0404

Keywords: *Earthquakes, *Disasters, *Coasts, Ocean waves, Mathematical models, Height, Geological faults, Hazards, Seismic epicenter, Boundaries, Continental shelves, Alaska, Japan, South America, Philippines, Australia, New Zealand, Far field effects.

The purpose of this study is to model the propagation of tsunamis from source regions off the west coast of South America to the continental shelf zone of Alaska, Japan, the Philippines, Australia, and New Zealand. The simulations were carried out by numerically solving the linear, inviscid equations for long waves. Potential generating areas were chosen by identifying seismic gaps in the Peru-Chile Trench area. Ocean bottom displacements in each source area were specified on the basis of representative earthquake parameters (depth, dip angle, fault length and width, slip displacement) chosen from an examination of historical seismicity patterns in the area. Areas of maximum offshore wave height were identified along each coastline in response to each earthquake/tsunami event. Several coastal areas were subjected to high concentrations of wave energy no matter where the source was located.

PB83-114249/GAA PC **A07**/MF **A01**
International Center for Living Aquatic Resources Management, Manila (Philippines).
International Center for Living Aquatic Resources Management Report 1981 (ICLARM),
Jay L. Maclean. 1981, 128p ICLARM REPORT-1981
Also pub. in ISSN-0115-4494.Color illustrations reproduced in black and white.

Keywords: *Research and development, *Aquaculture, *Fisheries, *Philippines, Management, Education, Fresh water fishes, Genetics, Financing, Developing country application, Tilapia.

This annual report of International Center for Living Aquatic Resources Management has sections on its research programs in aquaculture, traditional fisheries, resource development and management, and education and training; information service; advisory services; conferences, symposia, courses, and workshops; a list of papers presented at conferences and seminars; publications; linkages and agreements; and sources and application of funds.

PB83-114470/GAA PC **A03**/MF **A01**
Woods Hole Oceanographic Institution, MA.
Workshop on Cooperative International Marine Affairs.
Technical rept.,
James Broadus, Robert W. Knecht, David A. Ross, Kurt Shusterich, and Maynard Silva. Aug 82, 40p
WHOI-82-38, NOAA-82082402
Sponsored in part by William H. Donner Foundation, Pew Memorial Trust, and the Johnson Endowment Fund.

Keywords: *Fisheries, *Natural resources, Management, Government policies, Developing countries, Recreation, Waste disposal, Mineral deposits, Water pollution, Hydrocarbons, CIMAP program, 200 mile zone.

This report details the results of a workshop held at the Woods Hole Oceanographic Institution (WHOI) on April 20-21, 1982. The workshop, part of an effort by the Marine Policy and Ocean Management Program of WHOI intended to assist interested developing countries in formulating strategies for ocean resource use and management within their new 200-mile exclusive economic zones.

PB83-114629/GAA PC **A04**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Development of Livestock, Agriculture and Water Supplies in Botswana Before Independence: A Short History and Policy Analysis.
Occasional paper,
Emery Roe. Mar 80, 63p AID-PN-AAJ-639
Contract AID/ta-BMA-8
Prepared in cooperation with Ministry of Agriculture, Gaborone, Botswana.

Keywords: *Agriculture, *Agricultural economics, *Botswana, Rural areas, Economic development, History, Livestock, Production, Water supply, Sales, Income, South Africa, Developing country application.

Colonial Botswana's subordination of its water supply and agricultural sectors toward increasing livestock production resulted in stagnant agricultural production levels lasting until its independence in 1966. This report serves as a policy context for rural development efforts in Botswana, formerly Bechuanaland, by listing and analyzing the major factors from 1895 to 1965 that affected its livestock, water supply, and agricultural sectors. During this period, livestock production was the Batswana's major source of trade income, despite the problems of disease, limited grazing areas (due to water scarcity), and a lack of sustained sales--the latter due largely to periodic South African cattle embargoes and weight/supply restrictions.

PB83-114645/GAA PC **A03**/MF **A01**
Central Electrochemical Research Inst., Karaikudi (India).
Corrosion Bulletin, Volume 2, Number 4, July 1982.
Bimonthly journal,
K. S. Rajagopalan. Jul 82, 41p
See also Volume 4, Number 3, PB82-244211.

Keywords: *Corrosion, Periodicals, Railways, Corrosion prevention, India, Developing countries, Developing country application.

Contents: A march towards better corrosion control; Corrosion problems in railways - Case Study; Process for bringing down the corrosion of magnets in contactors; Electrochemical methods of protection; Techniques for measuring corrosion rates; Corrosion rate measuring meters; In-situ spectrochemical studies-1; Corrosion research in the Defense Materials and Stores Research and Development Establishment, Kanpur; and Proceedings of get-together on corrosion inhibitors.

PB83-115030/GAA PC **A11**/MF **A01**
Ministry of Public Health, Bangkok (Thailand).
Lampang Health Development Project Documentary Series. Volume I: Summary Final Report of the Lampang Health Development Project.
1981, 238p
Contracts AID/csd-3423, AID/ca-1320
See also Volume 2, PB83-115048.
Also available in set of 6 reports PC E99, PB83-115022.

Keywords: *Project evaluation, *Health care delivery, *Health, *Thailand, Hospitals, Professional personnel, Utilization, Services, Developing country application.

The documentary series comprises six volumes. Volume I summarizes the development, evaluation, conclusions, and recommendations of the Project. This volume is divided into chapters on: Project development and area background; community health volunteers and primary health care; community health paraphysicians - Wechakorn; community health role of the provincial hospital; management, supervision, and support; accessibility and utilization of health services; cost-effectiveness of the health system; impact on the population and environment; feasibility of implementing the Lampang system's key features nationwide; and major conclusions, recommendations, and implications. A list of personnel and consultants of the Lampang Health Development Project is included.

PB83-115048/GAA PC **A18**/MF **A01**
Ministry of Public Health, Bangkok (Thailand).
Lampang Health Development Project Documentary Series. Volume II: Development of an Integrated Rural Health Services and Primary Health Care System in Lampang, Thailand.
1981, 416p
Contracts AID/cad-3423, AID/ca-C-1320
See also Volume 1, PB83-115030, and Volume 3, PB83-115055.
Also available in set of 6 reports PC E99, PB83-115022.

Keywords: *Project evaluation, *Health care delivery, *Health, *Thailand, Rural areas, Paraprofessional personnel, Services, Hospitals, Developing country application.

Volume II describes the development of the Project, focussing on its key features. This volume is divided into monographs on: The Lampang Health Development Project - New Approaches to Rural Health Care; Developing Community Health Volunteers and Primary Health Care; Developing Community Health Paraphysicians (Wechakorn); Expanding the Community Health Role of the Provincial Hospital; Strengthening Management, Supervision, and Support for Integrated Rural Health Care; and A System of Evaluation and Management Information for Rural Health Development. A list of the personnel and consultants of the project are included in an Appendix, as are four papers entitled: Primary Health Care as a Key Strategy to Achieve Health for All by the Year 2000; The Thai Concept of Primary Health Care; An Historical Perspective of the Lampang Health Development Project; and An Open Letter to the Lampang Project Workers.

PB83-115055/GAA PC **A15**/MF **A01**
Ministry of Public Health, Bangkok (Thailand).
Lampang Health Development Project Dcoumentary Series. Volume III: Evaluation of the Lampang Integrated Rural Health Services and Primary Health Care System.
1981, 327p
Contracts AID-cad-3423, AID/ca-C-1320
See also Volume 2, PB83-115048, and Volume 4, PB83-115063.
Also available in set of 6 reports PC E99, PB83-115022.

Keywords: *Project evaluation, *Health, *Health care delivery, *Thailand, Evaluation, Services, Rural areas, Personnel, Performance evaluation, Cost analysis, Developing country application.

Volume III presents the Project evaluation, results, conclusions, and recommendations. This volume is divided into monographs entitled: Evaluating and monitoring integrated rural health services - lessons from the Lampang experience; accessibility and acceptance of rural health services in Lampang; health system and personnel performance and costs; impact on the population's health; and feasibility and affordability of implementing the Lampang system's key features nationwide - implications for the future.

PB83-115063/GAA PC **A09**/MF **A01**
Ministry of Public Health, Bangkok (Thailand).
Lampang Health Development Project Documentary Series. Volume IV: Community Health Volunteers' Manuels,
Choomnoon Promkutkao, and Stanley Zankel. 1981, 197p
Contracts AID/cad-3423, AID/ca-C-1320
See also Volume 3, PB82-115055, and Volume 5, PB83-115071.
Also available in set of 6 reports PC E99, PB83-115022.

Keywords: *Project evaluation, *Health, *Health care delivery, *Thailand, Manuals, Instructional materials, Paraprofessional personnel, Rural areas, Developing country application.

This volume is divided into five separate manuals. They are the: Health Post Volunteers' Manual; Health Post Volunteers' Nutrition Manual; Village Health Communicators' Manual; Village Health Communicators' Nutrition Manual; and Traditional Birth Attendants' Manual.

PB83-115071/GAA PC **A15**/MF **A01**
Ministry of Public Health, Bangkok (Thailand).
Lampang Health Development Project Documentary Series. Volume V: Community Health Paraphysician (Wechakorn) Training in Medical Care Modules 1-13,
Choomnoon Promkutkao, and Ronald Wilson. 1981, 347p
Contracts AID/cad-3423, AID/ca-C-1320
See also Volume 5, PB83-115063, and Volume 6, PB83-115089.
Also avialable in set of 6 reports PC E99, PB83-115022.

Keywords: *Project evaluation, *Health, *Health care delivery, *Thailand, Instructional materials, Services, Paraprofessional personnel, Professional personnel, Developing country application.

This volume is divided into 13 modules. They are: Introduction to comprehensive health care; medical terminology; anatomy and physiology; medical history-taking; physical examination; laboratory examinations; formulary - essential drugs for paraphysicians; common skin diseases; eye, ear, nose, and throat problems; medical problems; pediatric problems; gynecological problems; and emergency problems.

PB83-115089/GAA PC **A13**/MF **A01**
Ministry of Public Health, Bangkok (Thailand).
Lampang Health Development Project Documentary Series. Volume VI: Community Health Paraphysician (Wechakorn) Training in Public Health Modules 14-24,
Choomnoon Promkutkao, and Ronald Wison. 1981, 283p
Contracts AID/cad-3423, AID/ca-C-1320
See also Volume 5, PB83-115071.
Also available in set or 6 reports PC E99, PB83-115022.

Keywords: *Project evaluation, *Health, *Health care delivery, *Thailand, Instructional materials, Rural areas, Communities, Organizing, Developing country application.

This volume is divided into eleven modules. They are: Public health administration and primary health care; community health services - organization, management, and supervision; maternal and child health care; family planning; nutrition; dental health; environmental sanitation; statistics; epidemiology; communicable disease control; and health education.

PB83-115238/GAA PC **A04**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.

ICTA in Guatemala: The Evaluation of a New Model for Agricultural Research and Development.
Special series on agriculture research and extension,
Lynn Gostyla, and Willaim F. Whyte. Oct 80, 58p
ARE-3, AID-PN-AAJ-640
Contract AID/ta-BMA-8

Keywords: *Project evaluation, *Research and development, *Agriculture, *Guatemala, *Education, Social welfare, Rural areas, Agronomy, Production, Constraints, Monitoring, Farm crops, Cultivation, Evaluation, Developing country application.

Agricultural research can have no impact upon small farmers' cultivation practices unless it understands farmers' real problems and defines efficiency in farmers' terms. Traditional research and development efforts executed by technicians through commodity programs, and imposed upon farmers--often result in production techniques that are rejected by small farmers. This report describes the development of Guatemala's Institute of Agricultural Science and Technology (ICTA), which is dedicated to a decentralized research methodology designed to make research programs responsible for the adoption of appropriate agricultural techniques by including the contributions of farmers and social scientists.

PB83-115246/GAA PC **A08**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Local Organization and Participation in Integrated Rural Development in Jamaica.
Special series on rural local organization,
Arthur A. Goldsmith, and Harvey S. Blustain. Feb 80,
154p RLO-3, AID-PN-AAJ-642
Contract AID/ta-BMA-8

Keywords: *Rural areas, *Agricultural extension services, *Jamaica, Developing countries, *Agriculture, Farms, Technology, Local government, Organizations, Coordination, Planning, Developing country application.

Local organizations (LO's) perform a critical role in agricultural development projects by facilitating communication among farmers, legitimizing a project in the eyes of local farmers, mobilizing farmers in support of project activities, and encouraging community self-reliance. The report investigates the role of LO's in Jamaican agriculture in order to improve planning and implementation of the joint A.I.D.-Government of Jamaica Second Integrated Rural Development Project (IRD). The report concludes that Jamaican farmers will need to be more fully engaged in LO's to facilitate cooperation and the future spread of new technologies.

PB83-115253/GAA PC **A05**/MF **A01**
Research Triangle Inst., Research Triangle Park, NC.
Relationsips of Rural Development Strategies to Health and Nutritional Status: Consequences for Fertility. A State-of-the-Art Paper,
Raymond B. Isely, Laurie Zivetz, Roland Norman,
and Hetty Banatte. Jun 78, 97p AID-PN-AAJ-703
Contract AID/ta-CA-1
Prepared in cooperation with South East Consortium for International Development.

Keywords: *Fertility, *Rural areas, *Nutrition, Strategies, Reproduction(Biology), Development, Children, State of the art, Developing country application, Health status, Rural health services.

Knowledge of the health and nutrition effects of different rural development strategies on maternal health and fertility is critical to sound development planning. This report, one in a series of seven state-of-the-art papers prepared for A.I.D.'s Rural Development and Fertility Project, analyzes the link between rural development strategies and fertility indicators. Health status, particularly that of mothers and children, is treated as an intermediate variable. The relation of maternal health and child survival to fertility is detailed, with specific reference to the three aspects of reproduction--intercourse, conception, and outcome of gestation. While maternal health influences the possibility of conception and the outcome of pregnancy, child survival affects frequency of intercourse and, therefore, likelihood of conception.

PB83-115261/GAA PC **A12**/MF **A01**
Indian Agricultural Research Inst., New Delhi.
Annual Conference of Agricultural Research Statisticians (2) Held on 29th to 31st March, 1976: Contributed Papers and Proceedings,
R. K. Khosla, and R. S. Khatri. 1976, 274p
See also PB83-115279, and PB83-115287.

Keywords: *Agriculture, *India, Statistical analysis, Experimental design, Surveys, Animal husbandry, Plant reproduction, Breeding, Education, Universities, Developing country application.

The report contains the proceedings of the second annual conference of Agricultural Research Statistics on 29-31 March, 1976, held in New Delhi, India. Various topics covered are: Design and analysis of experiments; Sample surveys; Use of computer in agriculture and animal sciences research; Statistical technique in plant and animal breeding; Teaching of statistics in agricultural institutes and universities; and Research and training facilities and personnel policies.

PB83-115279/GAA PC **A09**/MF **A01**
Indian Agricultural Research Inst., New Delhi.
Conference of Agricultural Research Statisticians (3) Held on 24th to 26th April, 1979: Abstracts of Contributed Papers and Proceedings,
R. K. Khosla, R. S. Khatri, D. S. Anjeja, S. D. Bal,
and D. P. Singh. 1978, 176p
See also PB83-115261, and PB83-115287.

Keywords: *Research and development, Agriculture, *India, Abstracts, Forestry, Statistical analysis, Livestock, Fisheries, Data processing, Personnel development, Developing country application.

The report contains the proceedings of the third conference of Agricultural Research Statisticians on 24-26th of April, 1978, held in New Delhi, India. The topics covered are: Agriculture and forestry; Livestock and fisheries; Statistics needed for area planning; Data processing and information system; and Statistical personnel and their training.

PB83-115287/GAA PC **A13**/MF **A01**
Indian Agricultural Research Inst., New Delhi.
Conference of Agricultural Research Statisticians (4) Held on 25th to 27th June 1979: Abstracts of Contributed Papers and Proceedings,
R. K. Khosla, R. S. Khatri, and D. S. Aneja. 1979,
293p

Keywords: *Research and development, *Agriculture, *India, Abstracts, Statistical analysis, Grain crops, Livestock, Fishes, Production, Surveys, Forestry, Yield, Losses, Economic development, Rural areas, Developing country application.

The report contains the proceedings of the fourth conference of Agricultural Research Statistics on 25-27 June, 1979 held in New Delhi, India. The topics covered are: Agricultural statistics in crop sciences and forestry; Agricultural statistics in animal sciences; and Agricultural statistics in fisheries.

PB83-115337/GAA PC **A10**/MF **A01**
Indian Agricultural Research Inst., New Delhi.
Conference of Agricultural Research Statisticans (5) Held on 23rd to 26th December 1980: Contributed Papers and Proceedings,
R. K. Khosla, D. S. Aneja, and Madan Mohan. 1980,
225p
See also PB83-115287.

Keywords: *Research and development, *Agriculture, *India, Research projects, Statistical analysis, Surveys, Farm crops, Livestock, Forestry, Fisheries, Rural areas, Economic development, Developing country application.

The report contains the proceedings of the fifth conference of Agricultural Research Statistics on 23-26th December, 1980, held in New Delhi, India. The broad topics covered are: Current statistical research in Agricultural; Forestry; Livestock; and Fishery with respect to rural development.

PB83-115519/GAA PC **A02**/MF **A01**
Florida Cooperative Extension Service. Marine Advisory Program.
Mangroves: A Guide for Planting and Maintenance.
John Stevely, and Larry Rabinowitz. Jul 82, 10p
MAP-25, NOAA-82091406

Keywords: *Tropical regions, *Aquatic plants, Acclimatization, Sea water, Identifying, Planting, Cutting, Plant reproduction, Coasts, Water pollution, Plant ecology, Florida, Red mangrove, Black mangrove, White mangrove.

The report is a guide for planting and maintenance of mangroves. The report describes the biology of the mangroves; identification of Florida mangroves; planting, transplanting, pruning; and plant progration of mangroves.

PB83-115725/GAA PC **A03**/MF **A01**
Iowa State Univ., Ames.
Development of Nigerian Industrial Economy and the Prospects for U.S. Investment and Business Partnership,
Modestus Okere, and Howard Van Auken. 1982, 38p

Keywords: *Economic development, *Nigeria, Revenue, Agriculture, Industries, *Industrial development, Developing country application.

This comprehensive study of the Nigerian economy will help a businessman understand the import and contract policies of the Nigerian government, and points out likely areas of investment opportunity. The paper reviews Nigerian loan borrowing, money supply, revenue, national development plans, budgets, oil industry, banking, industrial growth, steel, automobile production, textiles, cement, breweries, transport, economic growth, and agriculture. The report then builds on the above basic data in outlining investment opportunities for U.S. business, starting with the incentives Nigeria has offered to foreign firms to invest in Nigeria. Sections in this chapter are devoted to farming, construction, poultry and cattle feed operations, petrochemicals, telecommunications, education, health care, electricity, consumer goods, control of foreign exchange, effects of indiginization, Nigerian partnership policies, Nigerian and American bi-lateral talks on economic problems, and long- and short-term outlook for investments.

PB83-115931/GAA PC **A99**/MF **A01**
Indian National Committee for the International Hydrological Programme, New Delhi.
Hydrological Aspects of Droughts - International Symposium Held at New Delhi on 3-7 December, 1979. Volume I.
Dec 79, 606p
See also Volume 2, B83-115949.Sponsored in part by Indian Inst. of Tech., New Delhi, Ministry of Agriculture and Irrigation, New Delhi (India), and India Meteorological Department.Portions of this document are not fully legible.

Keywords: *Hydrology, *Drought, Stream flow, Water wells, Rivers, Geomorphology, Sediment transport, Moisture, Rainfall, Inorganic salts, Water pollution, Ground water, Developing countries, India, Desertification, Water management(Applied).

Drought is a major hydrological phenomenon which occurs in one part or the other of the globe causing widespread miseries and economic distress, particularly to the developing countries. A global scientific study of its causes and effects and pooling these experiences for the most optimum utilization of our limited water resources have therefore been recognized by UNESCO while formulating the International Hydrological Program. The technical business of this symposium was conducted under 4 principal themes; Morphology and land regime; Water regime and water quality; Trends and prediction of droughts; and Management of droughts.

PB83-115949/GAA PC **A11**/MF **A01**
Indian National Committee for the International Hydrological Programme, New Delhi.
Hydrological Aspects of Droughts - International Symposium Held at New Delhi on 3-7 December, 1979. Volume II.
Dec 79, 229p
See also Volume 1, PB83-115931.Sponsored in part by Indian Inst. of Tech., New Delhi, Ministry of Agriculture and Irrigation, New Delhi (India), and India Meteorological Department.

Keywords: *Hydrology, *Drought, India, Geomorphology, Water quality, Predictions, Management, Rainfall, Mathematical models, Developing countries.

Drought is a major hydrological phenomenon which occurs in one part or the other of the globe causing widespread miseries and economic distress, particularly to the developing countries. A global scientific study of its causes and effects and pooling these experiences for the most optimum utilization of our limited water resources have therefore been recognized by UNESCO while formulating the International Hydrological Program. The technical business of this symposium was conducted under 4 principal themes, viz. Morphology and Lane regime; Water quality; Trends and prediction of droughts; and Management of droughts. Several case studies have also been presented.

PB83-116160/GAA PC **E13**/MF **E13**
Plastics and Rubber Inst., London (England).
Use of Plastics and Rubber in Water and Effluents (Joint Conference) 15 February to 17 February 1982 Held at The Royal Lancaster Hotel, London.
Feb 82, 324p

Keywords: *Plastics, *Water pollution, *Water treatment, *Sewage treatment, Pipelines, Maintenance, Plastic pipes, Cost analyses, Economics, Standards, Regulations, Tests, Performance evaluation, Utilization, Water quality.

Topics discussed include: problems and answers with pipeline systems, materials and equipment, and other uses and new developments.

PB83-116665/GAA PC **A04**/MF **A01**
Office of Human Development, Washington, DC.
Guia de Bolsillo para Ninera (A Pocket Guide to Babysitting).
1975, 61p DHEW/PUB/OHD-76-30011
Text in Spanish.

Keywords: *Children, *Training, Youths, Specialized training.

The report details responsibilities of babysitting and provides other kinds of information needed by babysitters, whether experienced or just beginning.

PB83-117333/GAA PC **A08**/MF **A01**
Resource Management Consultants, Inc., Boulder, CO.
Small Business in the Emerging Energy Technologies.
Final rept.,
Michael D. Yokell. 30 Sep 82, 172p*
Grant SB-1A-00011-01

Keywords: *Energy, National government, Industries, Economic analysis, Solar energy, Biomass, *Small businesses, Industrial structure, Photovoltaic conversion.

The original purposes of this work were twofold: first to determine the effect of federal procurement and loan policies (such as those of the Small Business Administration) on the size distribution of firms in the solar, photovoltaics, and biomass industries, and second, to examine the structure of these industries with a view toward where future opportunities might lie for small business.

PB83-117473/GAA PC **A03**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
World Agriculture: Outlook and Situation,
Cecil W. Davison. Sep 82, 29p* WAS-29
See also PB82-263302.

Keywords: *International trade, *Agricultural economics, Exports, Credit, Developing countries, Prices, Demand(Economics), Interest, Wheat, Corn, Soybeans, Rice, Vegetable oils, Tables(Data), Production, Food consumption, Inflation, Global.

Economic recovery may benefit commodity prices. The worldwide economic recovery, still expected to begin this year, should ease unemployment, increase overall consumption, and boost demand for U.S. agricultural products. Declining inflation and lower interest rates in the industrialized nations will help launch the turnaround. However, recovery in the developing and centrally planned nations will have to wait for renewed demand for their exports. As interest rates fall and the world's economies accelerate, the attractiveness of already low U.S. commodity prices may increase.

PB83-117861/GAA PC **A07**/MF **A01**
SRI International, Menlo Park, CA.
Using Nonservice Approaches to Strengthen Small Business: A Guide for Local Officials.
Conference draft (Final),
James O. Gollub. Nov 80, 141p*
Contract SBA-2653-OA-79

Keywords: *Financial management, Financing, Strategies, Capital, Fiscal policies, Taxes, Technical assistance, Management training, *Small businesses.

This guide presents ways that local governments can address problems confronting small businesses by redefining traditional policy relationships between local governments and the private sector. Its major focus is on what can be called 'nonservice approaches' to small business problems. Nonservice approaches--which complement service and direct lending approaches--serve small business needs through the purposeful shaping of local government policies (regulatory, administrative, tax) and the redefining of relationships in the community in order to leverage change in the behavior of the marketplace institutions, and individuals in ways that will enhance opportunities for small business.

PB83-118372/GAA PC **A05**/MF **A01**
Administration for Children, Youth and Families, Washington, DC.
El Cuidado de Su Bebe (Infant Care).
1981, 91p DHHS/PUB/OHDS-81-30013

Keywords: *Health, *Children, Feeding(Supplying), Clothing, Baths, Health, Parent child relations, Manuals.

The report covers the basics of caring for an infant (e.g., feeding, clothing, bathing, health care). It is written for parents who want to make sure their baby has a good start in life.

PB83-118406/GAA PC **A03**/MF **A01**
Children's Bureau, Washington, DC.
Conque Va a Ser un Nuevo Padre (So You're Going to be a New Father).
23 Sep 82, 36p DHHS/PUB/OHDS-74-63

Keywords: *Children, Interpersonal relations, Counseling.

The report offers counsel and suggestions to prospective fathers on what they should expect during their mates pregnancy including things to do and not do, and how to support and comfort their mates through this phase in their lives. The report discusses the moods and feelings new mothers and fathers usually experience.

PB83-118521/GAA PC **A03**/MF **A01**
Children's Bureau, Washington, DC.
Cuando Su Hijo Va al Hospital (When Your Child Goes to the Hospital).
7 Oct 82, 41p DHHS/PUB/OHDS-79-30246

Keywords: *Children, Parent child relations, Psychological guidance, Anxiety.

The report is a guide to help parents and other family members prepare the child for an expected stay in the hospital.

PB83-119008/GAA PC **A02**/MF **A01**
Central Indian Medicinal Plants Organisation, Lucknow (India).
Belladonna and Its Cultivation in India.
Farm bulletins 5 and 10,
Akhtar Husain. 1978, 15p

Keywords: *Medicinal plants, *India, Botany, Soil properties, Planting, Plant reproduction, Plant diseases, Harvesting, Storage, Economic factors, Developing country application, Belladonna, Rauvolfia serpentina.

This booklet is a compilation of two pamphlets, one on Belladonna and the other on Rauvolfia Serpentina. Belladonna is one of the most important plant drugs used in modern medicine throughout the world. Rauvolfia Serpentina is one of the most important crude drugs used in modern medicine. The subjects covered for each plant are: Botany; soil and climate; field preparation; propagation; transplanting; irrigation; fertilizer application; interculture; diseases and pests; harvesting; drying and storage; active constituents; uses; economics of cultivation.

PB83-119255/GAA PC **A03**/MF **A01**
Central Inst. of Medicinal and Aromatic Plants, Lucknow (India).
Cultivation of Plants for Their Essential Oils: Java Citronella; Eucalyptus Citriodora Hook; Davana; Geranium; and French Basil.
Farm bulletin,
O. P. Virmani, Pratap Singh, M. R. Narayana, M. Sarwar, and A. K. Srivastava. 1980, 40p

Keywords: *Plants(Botany), *India, Climate, Soil properties, Plant reproduction, Irrigation, Fertilizers, Plant diseases, Agricultural economics, Developing country application, Java citronella.

This book is a compilation of five pamphlets on the cultivation of various plants for their essential oils. The plants are Java citronella, Eucalyptus citriodora, Davana, Geranium, and French Basil. For each plant the following topics are covered: Botany; soil and climate; nurseries; field and soil preparation; propagation; irrigation and weeding; manures and fertilizers; etc.

PB83-119263/GAA PC **A04**/MF **A01**
Central Building Research Inst., Roorkee (India).
Manufacture of Bricks, Woodwool Boards, Clay Flooring and Roofing Tiles, Precast Building Components, Corrugated Roofing Sheets, and Gypsum Kettle and Plaster Board.
Project proposals,
N. C. Majumdar, Shri Arjun Dass, R. B. Hagela, M. P. Jaisingh, and S. M. Singh. 1980, 66p

Keywords: *Buildings, *Construction, *Building materials, Bricks, Fiberboards, Clays, Tiles, Roofing, Gypsum cements, Manufacturing, Kettles, Kilns, Developing country application.

This book is a compilation of six project proposals. They are: Manufacture of Bricks by Semimechanized Process including High Draught Kiln, covering plant, process, materials handling, drying space, labor, capital outlay, and cost estimates; Making Woodwool Boards at Small Scale Level, covering estimated demand and consumer acceptability, plant, process, capital investment, cost of production, and profitability; Manufacture of Clay Flooring and Roofing Tiles, covering raw materials, consumer acceptability, moulding and pressing, drying, firing, down draught kiln, Hoffman kiln, costs, and preparation of clays; Production of Precast Building Components on a Small Scale, covering precast components to be produced, capital investment, selling price, cost of material and labor, and several working diagrams; Corrugated Roofing Sheets from Wood Wool or Coir Waste and Portland Cement, covering the process, properties of the corrugated sheets, plant and machinery requirements, costs, and properties of the raw materials; and Gypsum Kettle and Plaster Board, covering salient features and cost estimates of a gypsum calcining kettle, raw materials for plaster board, methods of casting, costs, and profitability.

PB83-120030/GAA PC **A05**/MF **A01**
Indian Univ. Association for Continuing Education, New Delhi.
Adult Education in Indian Universities.
1977, 100p

Keywords: *Education, *India, Developing countries, Meetings, Adults, Universities, Developing country application, Continuing education.

Reports of two seminars on Extension Programmes and adult education in Indian Universities are presented. It contains the summary of discussions, recommendations and papers of the seminars. The topics covered are: An Action Research Approach to Designing Training for Continuing Education; Training for Behavioural Change, Training and Refresher Courses; Continuing Education and Extension Programme in the University; Contents and Techniques of Extension Programmes by the University; The Burden of Social Responsibility and the Conscience of Society; Universities, Adult Education and the Indian Context; Concept of University Adult Education; Some Possible Next

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Step; and Universities and Training and Research in Adult Education.

PB83-120121/GAA PC **A04**/MF **A01**
Children's Bureau, Washington, DC.
Cuidado Prenatal (Prenatal Care).
1973, 72p NN-4-1973, DHEW/PUB/OHD-75-12
Text in Spanish.

Keywords: *Health, Pregnancy, Food, Clothing.

The booklet gives the expectant mother advice on caring for herself during pregnancy. It covers such items as food and health, clothing and personal hygiene and discuses some common complaints and what to do about them. Also, described are the needs of a newborn baby.

PB83-120428/GAA PC **A02**/MF **A01**
Children's Bureau, Washington, DC.
Un Nino Desventajado en Su Casa (A Handicapped Child in Your Home).
1974, 19p DHEW/PUB/OHD-74-48

Keywords: *Children, *Health, Specialized training, Parent child relations.

The report discusses the problems, hardships and rewards that parents will experience in caring for a handicapped child at home.

PB83-121863/GAA PC **A02**/MF **A01**
Office of Human Development Services, Washington, DC.
El Desarrollo del Nino en el Hogar (Child Development in the Home).
1980, 23p DHHS/PUB/OHDS-81-30049
Text in Spanish.

Keywords: *Children, Development, Parent child relations, Disciplining, Learning.

The report offers suggestions to parents to help them help their children develop into happy, self-confident and self disciplined children and adults.

PB83-124065/GAA PC **A03**/MF **A01**
Department of Housing and Urban Development, Washington, DC. Office of Policy Development and Research.
Selected Background Papers: Housing Construction Codes and Standards.
Nov 81, 40p HUD-0002451

Keywords: *Housing, *Construction, *Buildings, Standards, Guidelines.

This document contains five papers, each of which focuses on a different aspect of construction codes and standards. One paper examines the background leading up to congressional approval of development and promulgation of mandatory building energy performance standards (BEPS) and subsequent modification of the BEPS to "voluntary" standards. Another paper discusses manufactured housing construction and safety standards with special attention to revision of Federal standards, how the Federal standards relate to those in the private sector, and if the standards meet minimum health and safety concerns. The history and influence of the HUD single - family Minimum Property Standards is described, and the development of the One and Two Family Dwelling Code is discussed. Additional papers (1) consider building product approval systems for innovations and procedures to determine compliance with standards and (2) review the private sector standards development process in relation to how these standards can be used for Federal purposes. Each paper presents background information, a statement and analysis of issues, and options. Some references are given.

PB83-124479/GAA PC **A06**/MF **A01**
Central Inst. of Road Transport, Poona (India).
Bus and Crew Scheduling: Proceedings of the 3-Day Workshop Held at C.I.R.T. from 4th to 6th September 1978,
P. Sundarsanam. 1978, 124p

Keywords: *Buses(Vehicles), Scheduling, Developing countries, Personnel, Routes, Rural transportation, Developing country application.

The report discusses the most important single factor in determining the efficiency of transport operations - in the hope of evolving certain basic ideas for adaptation throughout the industry. The workshop was fairly well attended and as many as 12 state Transport Undertakings different kinds of operating conditions have been represented. The proceeding contain the discussion and the various papers presented. The topics dealt were: Bus and Crew Scheduling for Rural Passenger Transport; Route, the Origin, Characteristics and Behavior; Break-Even Analysis; and Scheduling.

PB83-125864/GAA PC **A05**/MF **A01**
National Science Foundation, Washington, DC. Div. of Industrial Science and Technological Innovation.
Small Business Innovation Research Program: Abstracts of Phase I Grants,
Sep 81, 81p NSF/ISI-82007

Keywords: *Research and development, *Small Businesses, Technology innovation, *Technology transfer, Project management, Businesses, National government.

Abstracts of 86 research grants are provided. The awards were made to small science-and technology-based firms for advanced research in the following areas of potential application: materials; bio-sources of materials; genetics; advanced manufacturing processes; advanced chemical processes; industrial biological processes; microelectronics; communications and systems; computer science and engineering; robotics and controls; scientific and industrial measurements; radiation processing and control; light machinery and components; advanced automotive research; food process engineering; marine resources; mineral resources; environmental technology; tunneling; earthquake engineering; science and technology to aid the handicapped; and appropriate technology. Potential commercial applications are suggested for each of the technologies.

PB83-126656/GAA PC **A04**/MF **A01**
Economic Research Service, Washington, DC.
Agricultural Outlook,
Leland Scott. Oct 82, 54p AO-81
See also PB82-241878.

Keywords: *Productivity, *Farming, *Crops, *Agricultural economics, Supply(Economics), Corn, Wheat, Soybeans, Demand(Economics), Grains(Food), Developing countries, Marketing, Recovery, United States.

Agricultural economy-like last year, large crop supplies and a weaker-than-expected economy are dominating prospects for the new marketing year. Record U.S. production is now forecast for corn, wheat, and soybeans. Meanwhile, the July tax cut has not yet boosted the U.S. economy as anticipated. Besides dampening domestic demand, the slow recovery of the U.S. economy is also limiting foreign demand for grains and oilseeds.

PB83-127324/GAA PC **A05**/MF **A01**
Mathtech, Inc., Princeton, NJ.
Impact of Public R and D Patenting and on Scientific Manpower Retention by Firms in the Private Sector,
Harold J. Brumm, Jr., Judith Tapiero, and Donald E. Wise. 31 Dec 81, 80p NSF/PRA-81036
Grant NSF-PRA80-03844
See also PB83-127316.

Keywords: *Research and development, Industrial development, Technology, Professional personnel, Scientists, Engineers, Models, Regression analysis, Manpower utilization, Patenting.

Results are presented of a study of the effects of publicly-funded research and development (R&D) on R&D-performing firms. Two hypotheses were tested: (1) government-funded R&D work has significant beneficial spill-over effects on the private sector commercial activities of the firms engaged in that work; and (2) the more publicly-supported R&D work which a firm does, the greater will be the voluntary turnovers of its technical and scientific work force. The first hypothesis is supported by data obtained from the study and thus assumed to be correct. The empirical results obtained regarding the second hypothesis are inconclusive. Further research, using either a merged data base or obtaining additional information, is recommended.

PB83-128546/GAA PC **A08**/MF **A01**
Booz-Allen and Hamilton, Inc., Bethesda, MD. Transportation Consulting Div.
Profiles of Major Suppliers to the Automotive Industry. Volume 1: Overview.
Final rept. Oct 78-Oct 80,
J. A. Mateyka, W. R. Magro, A. S. Karlin, and D. J. Yee. Aug 82, 160p* DOT-HS-806-216, , DOT/TSC/NHTSA-82-1-1
See also Volume 2, PB83-128553.
Also available in set of 7 reports PC E99, PB83-128538.

Keywords: *Machine tools, *Automobiles, Machine tool industry, Economic analysis, Glass industry, Iron and steel industry, Fiberglass reinforced plastics, Aluminum industry, Machine tools, Plastics industry, Multinational corporations, Industrial structure, Steel industry, Organizational structure.

This study summarizes extensive information collected over a two-year period (October 1978 to October 1980) on suppliers of parts and components, materials, and machine tools to the automotive industry in the United States. The objective of the study was to provide data and information in support of analyses of the U.S. automotive industry. The results of this effort are published in seven volumes -- Volume I: Overview; Volume II: Iron, Steel, and Aluminum Suppliers to the Automotive Industry; Volume III: Plastics, Glass, and Fiberglass Suppliers to the Automotive Industry; Volume IV: North American Parts and Component Suppliers to the Automotive Industry; Volume V: Multinational Automotive Parts and Components Suppliers; Volume VI: Foreign Automotive Parts and Components Suppliers; and Volume VII: Machine Tool Suppliers to the Automotive Industry.

PB83-128553/GAA PC **A14**/MF **A01**
Booz-Allen and Hamilton, Inc., Bethesda, MD. Transportation Consulting Div.
Profiles of Major Suppliers to the Automotive Industry. Volume 2: Iron, Steel and Aluminum Suppliers to the Automotive Industry.
Final rept. Oct 78-Oct 80,
J. A. Mateyka, W. R. Magro, A. S. Karlin, and D. J. Yee. Aug 82, 325p* DOT-HS-806-217, , DOT/TSC/NHTSA-82-1-2
See also Volume 1, PB83-128546, and Volume 3, PB83-128561.
Also available in set of 7 reports PC E99, PB83-128538.

Keywords: *Automobiles, Manufacturers, Metal industry, Economic analysis, Materials, *Steel industry, Industrial structure, Organizational structure.

This study provides extensive information collected over a two-year period (October 1978 to October 1980) on suppliers of parts and components, materials, and machine tools to the automotive industry in the United States. The objective of the study was to provide data and information in support of analyses of the U.S. automotive industry. Volume 2 concentrates on the suppliers of iron, steel, and aluminum products used in automobile manufacturing.

PB83-128561/GAA PC **A13**/MF **A01**
Booz-Allen and Hamilton, Inc., Bethesda, MD. Transportation Consulting Div.
Profiles of Major Suppliers to the Automotive Industry. Volume 3: Plastics, Glass and Fiberglass Suppliers to the Automotive Industry.
Final rept. Oct 78-Oct 80,
J. A. Mateyka, W. R. Magro, A. S. Karlin, and D. J. Yee. Aug 82, 298p* DOT-HS-806-218, , DOT/TSC/NHTSA-82-1-3
See also Volume 2, PB83-128553, and Volume 4, PB83-128579.
Also available in a set of 7 reports PC E99, PB83-128538.

Keywords: *Plastics, *Glass, *Automobiles, Spare parts, Manufacturers, Materials, Economic analysis, Components, Industrial structure, Organizational structure.

This study provides extensive information collected over a two-year period (October 1978 to October 1980) on suppliers of parts and components, materials, and machine tools to the automotive industry in the United States. The objective of the study was to provide data and information in support of analyses of the U.S. automotive industry. Volume 3 concentrates on the suppliers of plastic, glass, and Fiberglass products used in automobile manufacturing.

PB83-128579/GAA PC **A13**/MF **A01**
Booz-Allen and Hamilton, Inc., Bethesda, MD. Transportation Consulting Div.
Profiles of Major Suppliers to the Automotive Industry. Volume 4: North American Automotive Parts and Components Suppliers.
Final rept. Oct 78-Oct 80,
J. A. Mateyka, W. R. Magro, A. S. Karlin, D. J. Yee, and D. M. Wasserman. Aug 82, 297p* Dot-HS-806-219, , DOT/TSC/NHTSA-82-1-4
Contract DOT-TSC-1626
See also Volume 3, PB83-128561, and Volume 5, PB83-128587.
Also available in set of 7 reports PC E99, PB83-128538.

Keywords: *Automobiles, Economic analysis, Manufacturers, Industrial structure, Organizational structure.

This study provides extensive information collected over a two-year period (October 1978 to October 1980) on suppliers of parts and components, materials, and machine tools to the automotive industry in the United States. The objective of the study was to provide data and information in support of analyses of the U.S. automotive industry. Volume 4 concentrates on the North American suppliers of automotive parts and components used in automobile manufacturing.

PB83-128587/GAA PC **A13**/MF **A01**
Booz-Allen and Hamilton, Inc., Bethesda, MD. Transportation Consulting Div.
Profiles of Major Suppliers to the Automotive Industry. Volume 5: Multinational Automotive Parts and Components Suppliers.
Final rept. Oct 78-Oct 80,
J. A. Mateyka, W R. Magro, A. S. Karlin, D. J. Yee, and D. M. Wasserman. Aug 82, 281p* DOT-HS-806-220, , DOT/TSC/NHTSA-82-1-5
See also Volume 4, PB83-128579, and Volume 6, PB83-128595.
Also available in set of 7 reports PC E9, PB83-128538.

Keywords: *Automobiles, Economic analysis, Manufacturers, Industrial structure, Organizational structure.

This study provides extensive information collected over a two-year period (October 1978 to October 1980) on suppliers of parts and components, materials, and machine tools to the automotive industry in the United States. The objective of the study was to provide data and information in support of analyses of the U.S. automotive industry. Volume 5 concentrates on the multinational suppliers of automotive parts and components used in automobile manufacturing.

PB83-128603/GAA PC **A06**/MF **A01**
Booz-Allen and Hamilton, Inc., Bethesda, MD. Transportation Consulting Div.
Profiles of Major Suppliers to the Automotive Industry. Volume 7: Machine Tool Suppliers to the Automotive Industry.
Final rept. Oct 78-Oct 80,
J. A. Mateyka, W. R. Magro, D. M. Wasserman, and D. J. Yee. Aug 82, 125p* DOT-HS-806-222, , DOT/TSC/NHTSA-82-1-7
See also Volume 6, PB83-128595.
Also available in set of 7 reports PC E99, PB83-128538.

Keywords: *Automobiles, *Machine tools, Economic analysis, Machine tools, Manufacturers, Industrial structure, Organizational structure.

This study provides extensive information collected over a two-year period (October 1978 to October 1980) on suppliers of parts and components, materials, and machine tools to the automotive industry in the United States. The objective of the study was to provide data and information in support of analyses of the U.S. automotive industry. Volume 7 concentrates on suppliers of machine tools used in automobile manufacturing.

PB83-128769/GAA PC **A03**/MF **A01**
National Research Council, Washington, DC.
Data Collection: A Statement for Administrators.
Rept. no. 7 (Final).
1981, 36p
Contract AID/pha-C-1161

Keywords: *Information systems, Surveys, Sampling, Policies, Developing countries, *Fertility, Mortality.

This report contains a brief summary statement for administrators and policy makers on how to improve data collection processes related to the estimation of fertility and mortality levels and trends. Administrators and policy makers are frequently responsible for many operations and activities and thus may prefer a statement that highlights in relatively nontechnical terms several major considerations in the selection, organization and implementation of data collection procedures designed to collect data for estimating fertility and mortality. In developing this work, the report includes a statement that contains many important points concerning the difficulties, trade-offs and complementarities, advantages and disadvantages of particular data-collection methods, but does not attempt to develop each point beyond summary general statements.

PB83-128850/GAA PC **A07**/MF **A01**
Family Health Care, Inc., Washington, DC.
Health Impact Guidelines for the Design of Development Projects in the Sahel, Volume I: Sector-Specific Reviews and Methodology.
Final rept.
13 Apr 79, 135p AID-PN-AAJ-381
Grant AID/afr-C-1138
See also Volume 2, PB83-128868.

Keywords: *Health, Public health, Reviews, Guidelines, Fisheries, Development, Agriculture, Transportation, Methodology, *Sahel, Developing country application, *Environmental impacts, Environmental health.

A new rural road improves mobility, communication, and levels of living, but it can also increase traffic accidents, transmit disease, and damage nearby farms and pastures. Such is the dual nature of development-desirable outcomes may have undesirable side-effects. This report, the first of two volumes, outlines the environmental and health impacts that can occur in development in the Sahel and suggests measures to limit their effect. Rainfed and irrigated agriculture can increase population density and the concentration of toxic substances in soil, plants, and human tissue and can cause a dramatic rise in the incidence of water-borne diseases (E.G., schistosomiasis, malaria) and communicable diseases.

PB83-128868/GAA PC **A10**/MF **A01**
Family Health Care, Inc., Washington, DC.
Health Impact Guidelines for the Design of Development Projects in the Sahel, Volume II: Reference Manual.
Final rept.
13 Apr 79, 210p AID-PN-AAJ-382
Grant AID/afr-C-1138
See also Volume 1, PB83-128850.

Keywords: *Health, Public health, Reviews, Guidelines, Fisheries, Development, Agriculture, Transportation, Methodology, *Sahel, Developing country application, *Environmental impacts, Environmental health.

In the Sahel, as elsewhere in the world, a basic assumption of development efforts is that the downward spiral between disease, poor nutrition, population growth, and economic stagnation can be reversed and the quality of life improved. However, in the Sahel, despite large-scale efforts to eradicate or control diseases and provide health services to the population, the incidence and pattern of disease have changed little over the past several decades. This report, a reference manual accompanying a volume of sector-specific analyses, profiles the major diseases afflicting the Sahel.

PB83-128934/GAA PC **E04**/MF **E04**
Open Univ., Milton Keynes (England). Alternative Technology Group.
Smallholdings and Food Production,
Robert Vale. Nov 77, 45p

Keywords: *Food, *Farming, *Technology transfer, *Productivity, *Agricultural economics, Efficiency, Soil fertility, Yield, Area, Diets, Livestock, Dairy cattle, Swine, Grain crops, Vegetables, Dairy products, Employment, Great Britain, Developing country application.

Studies have implied that as farming is made more efficient in terms of its use of labor and capital, it will produce less food per acre. Efficient farming methods also seem to reduce the long term maintenance of soil fertility. This study explores these concepts and has sections devoted to: size, efficiency, and food production; increasing food production; an existing smallholding which uses appropriate technology; types of diet; yields and cropping plans; cropping for livestock; cropping for cows; cropping for chickens; cropping for pigs; cropping for sheep; cropping for an existing holding; and the implications of the findings in the previous sections. The study concludes that smallholding agriculture would more likely reduce food imports and provide a satisfactory diet than current practice which emphasizes efficiency through economies of scale. Smallholding would also provide more employment, while leaving the United Kingdom with a proportionately smaller agricultural labor force.

PB83-128942/GAA PC **E04**/MF **E04**
Open Univ., Milton Keynes (England). Alternative Technology Group.
Recycling Opportunities for Neighbourhoods and Communities,
Chris Thomas. Oct 81, 27p ATG-10

Keywords: Recirculation, Paper, Glass, Plastics, Metals, *Waste recycling, Developing country application.

This paper discusses recycling paper, glass, plastics, and metals. It presents a community technology approach to recycling, and reviews present efforts in repair and renovation, reuse, and recycling. A final chapter on the appropriateness of recycling technologies to neighborhoods and communities concludes that only a paper recycling plant can be supported by a neighborhood (100 people) and a pulp packaging unit would require a community (1000 people). A district (10,000) people would be required to support a small-scale cellulose insulation manufacturing plant, 100,000 people are needed to support a glass/resin tile production plant, and 1,000,000 people are needed to support small-scale aluminum smelting.

PB83-128959/GAA PC **E04**/MF **E04**
Open Univ., Milton Keynes (England). Alternative Technology Group.
Family and Community Biogas Plants in Rural India and China,
Robin Roy. 1980, 32p ATG-9
Prepared in cooperation with Appropriate Technology Development Association, Lucknow (India).

Keywords: *Biomass, *Agricultural wastes, Sewage, Design, Performance evaluation, *Industrial plants, Fuels, *Biogas, Developing country application, Manure.

This report contains the basic theory of biogas production, tables of expected production, installation costs, architectural diagrams for both the Indian and Chinese plants, a case for community biogas plants in India, a pilot community biogas scheme in Uttar Pradesh, and conclusions. The conclusions were that cooking fuel should be supplied for free or deforestation would continue, not enough fuel can be generated anyway without the use of other fuels as well in many communities, electric lighting is not a strongly felt need in most rural communities and should be introduced later, factionalist tendencies must be overcome for the scheme to work, and community biogas plants will offer a more reliable yield and may be supported by agricultural as well as animal and human wastes.

PB83-128967/GAA PC **E03**/MF **E03**
Open Univ., Milton Keynes (England). Alternative Technology Group.
Green Cars: A Brief Guide to Shared Car Ownership,
Steve Cousins. 1978, 14p ATG/4/81

Keywords: *Motor vehicles, *Economic analysis, Agreements, Economic factors, Financing, Scheduling, Cost analysis, Insurance, Developing country application.

Green cars are cars shared by people who would not normally share cars, i.e., family members. The main advantage of sharing a car is economic, unless the owners could not otherwise afford a car at all and would have to rely on public transportation or walk. The report covers payment by the mile or other financial schemes, compatibility of schedules, setting up a car sharing scheme, estimating the mileage charge, histories of shared car ownership schemes, and a sample agreement for such a scheme.

PB83-128975/GAA PC **E04**/MF **E04**
Open Univ., Milton Keynes (England). Alternative Technology Group.
Comparison of Commercial and Do-It-Yourself Solar Collectors,
Robin Roy. Jan 79, 39p ATG-7

Keywords: Comparison, Durability, Performance tests, Economic analysis, *Solar collectors, Developing country application.

The title of this report is self-explanatory. It has sections on testing, method (two tanks of the same size side by side to insure that all conditions were the same), thermal performance, durability, economics. (The commercial system was unlikely to recover its cost while the home made system should recover its cost in 10 years.)

PB83-129015/GAA PC **E03**/MF **E03**
Open Univ., Milton Keynes (England). Alternative Technology Group.
Alternative Technology, Self-Sufficiency and the Future of Work,
Peter Read. Jan 80, 24p ATG-6

Keywords: *Socioeconomic status, *Productivity, Resources, Technology, Economic factors, Research management, Communities, *Employment, Experimental design, Developing country application.

This report studies ways to improve peoples' social welfare while using fewer resources. The report addresses technological choice and research design; work, self-exploitation, and economic growth; alternative work and alternative production; practical difficulties; and research activities. The latter include domestic scale self-sufficiency studies, the Redfield community, the Rainbow community, and the Simpson Brook proposal.

PB83-129023/GAA PC **E04**/MF **E04**
Open Univ., Milton Keynes (England). Alternative Technology Group.
Community, Technology, and Design: The Utopian Example of the Shakers,
Nigel Cross. Jul 77, 61p

Keywords: *Technology assessment, *Community development, *Social change, Culture(Social science), Societies, Attitudes, Regulations, Developing country application, Shakers.

This paper explores how technology and community interact in a idealized relationship, and how that interaction is both reflected in and influenced by the design process. The Shakers offer a particularly good example in that they founded a relatively large number of ideal, communitarian societies and developed complementary attitudes to technology and design. The paper covers the origins of Shakerism, Shaker life, Shaker inventiveness, the Shaker environment, the Shaker contribution to communitarianism, utopia or dystopia, and the decline of Shakerism. An appendix of millenial laws relating to environmental design is included.

PB83-129031/GAA PC **E03**/MF **E03**
Open Univ., Milton Keynes (England). Alternative Technology Group.
Appropriate Technologies for Basic Energy Needs in Rural India.
Working paper,
Robin Roy. Feb 80, 25p

Keywords: *Energy source development, *Fuels, Technology, Wind power generation, Solar energy, Wood, Industrial plants, Design criteria, Developing country application, India.

The objectives of this study were to: estimate the total village energy requirement for domestic needs; determine energy potential available from biogas, wind, solar, mini-hydroelectric, and low temperature wood carbonization sources; identify suitable plant design for these sources and estimate costs; and recommend the most economic and efficient form from each source for the village. Energy use patterns were determined and reported, and technological options listed. There are no conclusions; the report is to be used to study options to determine the best ones for a particular circumstance.

PB83-131094/GAA PC **A10**/MF **A01**
National Academy of Engineering, Washington, DC.
Competitive Status of the U.S. Auto Industry: A Study of the Influences of Technology in Determining International Industrial Competitive Advantage.
1982, 218p
Contract NSF-79-02702

Keywords: *Automobiles, *Industrial plants, *Technology assessment, Regulations, International trade, Personnel management, Technology innovating, Economic analysis.

Beginning with a brief history of the U.S. automobile industry, this new report examines historical trends that have been of great importance in the industry's development up to the present crisis. It proves a probing analysis of the current situation, seeking to understand developments in the market, the competitiveness of domestic automobiles, and the role of technical advance. Other major topics include an assessment of the comparative cost and quality of U.S. products and the role of technology in competition. The report considers alternative scenarios of the industry's future and discusses their implications for public and private policies.

PB83-131292/GAA PC **A20**/MF **A01**
Swedish Inst. for Metals Research, Stockholm.
Swedish Symposium on Non-Metallic Inclusions in Steel Held on 27-29 April 1981.
1981, 467p*
See also PB83-131300 through PB83-131466.

Keywords: *Steel Industry, Control, Metallography, Mechanical properties.

Contents:
- Clean steel - a debatable concept;
- Injection metallurgy and inclusion control;
- Inclusion picture and inclusion origin in a calcium treated steel;
- Use of lime based powders for improving inclusion morphology cleanliness and mechanical properties of aluminum-killed steel;
- Metallurgical control of inclusions;
- Sulphide shape control at the steel processing of heavy gauge Z-plate;
- Control of inclusion content in Fe-50%Ni ingots through deoxidation with Al and Ce-mischmetal;
- Inclusion pattern of stainless steel subjected to powder injection treatment in the ladel;
- How to quantify steel cleanliness;
- PASEM - (The particle analysing scanning electron microscope) applied to the study of non-metallic inclusions;
- Transfer of two dimensional size distributions of inclusions to three dimensions;
- Computer synthesis of microstructures in stereological analysis;
- The influence of non-metallic inclusions on properties in steel - a review;
- How particles control ductile fracture during tensile testing and metal working operations;
- The effect of notches and non-metallic inclusions on the fatigue properties of high strength steel;
- The effect of ca-treatment on the machinability of steel and Inclusions and polishability.

PB83-131516/GAA PC**$10.00**/MF **A01**
Department of Commerce, Washington, DC. Office of the Assistant General Counsel for Economic Affairs.
Information and Steps Necessary to Form Research and Development Limited Partnerships.
Draft rept.
30 Nov 82, 104p*

Keywords: Organizations, Research projects, Investments, Risk, Financing, Taxes, Incentives, Productivity, *Research and development, Venture capital.

This document provides an overview of the structure, formation and operation of Research and Development Limited Partnerships (RDLP's). The reserch and development limited partnership (RDLP) is a type of business organization which makes it possible to form syndicates for venture capital for research and development. As such, the RDLP is an alternative to the traditional sources of the funding for business research. The RDLP removes the limitations on R&D expenditures which arise naturally if R&D is funded out of a firm's retained earnings or from borrowed money. An RDLP can finance an existing firm's R&D, or can provide the seed money for a business start-up by tapping the venture capital market. It offers an effective means of financing small and large scale projects.

PB83-131961/GAA PC **A04**/MF **A01**
Stanford Univ., CA.
Development and Organization of Industrial Research and Development,
Final rept.,
Nathan Rosenberg, and David C. Mowery. Jul 81, 65p NSF/PRA-81034
Grant NSF-PRA77-21852
Prepared in cooperation with Harvard Univ., Boston, MA. Graduate School of Business Administration.

Keywords: *Industrial development, *Research and development, *Management techniques, Technology innovation, Industries, United States, Western Europe, National government, Government policies, Foreign government, Aircraft industry, Integrated circuits, Manufacturing.

Research was undertaken to collect and analyze data on the development of the industrial research laboratory in the United States and Western Europe and to examine the interaction between government policy and innovation and innovation and market structure. Trends in laboratory foundation and laboratory employment are discussed and the relationship between contract and in-house research is analyzed. In a high proportion of all cases, the firms contracting with independent research organizations were purchasing such services as a complement to, rather than a substitute for, inhouse research activities. The American aircraft industry, judged in terms of growth in output, exports, productivity, and product innovation, is considered a star performer in the American economy. Government policies are shown to be partly responsible for the industry's record of innovation and growth. Very Large Scale Integration (VLSI) is discussed and shown to be a technological building block which will allow the historical trend of increasing chip complexity, accompanied by reduction in cost per unit of complexity, to continue. Conceptual issues in the study of innovation are considered.

PB83-131995/GAA PC **A07**/MF **A01**
Transportation Systems Center, Cambridge, MA.
World Motor Vehicle Demand.
Final rept. Jul 81-Jun 82,
David A. Westenberg, and K. H. Schaeffer. Aug 82, 130p DOT-TSC-NHTSA-82-6, DOT-HS-806-215

Keywords: *Economic analysis, *Motor vehicles, Automobiles, Trucks, Forecasting, Foreign countries.

The report discusses the level and nature of world motor vehicle demand for the period 1980-1990. A general understanding of the structure of motor vehicle demand is developed. Published demand forecasts, varying widely, are gathered and their discrepancies explained. Based on analyses of individual nation motor vehicle registrations, sales data, economic variables, and energy situations, together with the general determinants of vehicle demand, sub-regional and regional demand forecasts are developed into a most likely forecast range.

PB83-132621/GAA PC **A14**/MF **A01**
National Research Council, Washington, DC.
Energia para el Desarrollo Rural: Recursos Renovables y Alternativas Tecnologicas para Paises en Vias de Desarrollo (Energy for Rural Development: Renewable Resources and Alternative Technologies for Developing Countries).
1976, 315p
Contract AID/csd-2584
Text in Spanish. See also English version, PB-260 606.

Keywords: *Renewable energy, *Rural areas, *Energy source development, *Natural resources, Substitutes, Technology, State of the art, Developing country application.

This report provides a summary of the state of the art of alternative technologies frequently suggested as solutions to rural or individual family energy needs. Moreover, it informs both the technologist and the planner where to go for more detailed information and what kinds of research and development are needed before a particular device or process is ready for use.

PB83-133025/GAA PC **A16**/MF **A01**
National Research Council, Washington, DC.
Computer Programs for Demographic Estimation: A User's Guide.
Rept. no. 11 (Final).
Hania Zlotnik. 1981, 370p*
Sponsored in part by Agency for International Development, Washington, DC.

Keywords: *Computers, *Demography, *Fertility, Population growth, Life span, Vital statistics, Demographic surveys, Computer programming.

This report examines ways to improve the technologies for estimating fertility and mortality when only incomplete or inadequate data exist. The need was recognized for relatively easy-to-use computer programs that would apply basic indirect techniques to various data sets. The eight programs contained in this guide implement various combinations of the following techniques: the P/F ratio method of fertility estimation, Brass-type methods for estimating child mortality, estimation of adult mortality from information on the widowhood and orphanhood status of respondents, estimation of the completeness of death registration, and the own-children method of fertility estimation. The chapters describe in detail how to use each program.

PB83-133116/GAA PC **E04**/MF **E04**
Commission of the European Communities, Luxembourg.
Energy from Marine Biomass: Methane Production by Mariculture on Land.
Final rept.,
K. Wagener. c1981, 71p EUR-7570-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Keywords: *Technology transfer, *Biomass, *Methane, Marine atmospheres, Fuels, Methyl alcohol.

A system for biofuel farming in arid coastal areas is at present under investigation in a cooperative European project. The biomass production is based on seawater which is pumped through shallow artificial ponds. Due to the high productivity of phytoplankton, easy fermentation to methane, and complete mineral nutrients recycling, the net energy balance (output/input) is expected to be 14 for methane and 7 for methanol, respectively. Since no fertile land or fresh water is needed, there is no competition with food production on arable land. Such a system is entirely self-contained energy-wise, which makes it attractive for remote desert areas and developing countries.

PB83-133355/GAA PC **A06**/MF **A01**
National Information Centre for Leather and Allied Industries, Madras (India).
Animal By-Products: Their Processing and Utilisation,
K. J. Scaria, Mahendra Kumar, and S. Divakaran. 1981, 121p NICLAI/SER-3

Keywords: *Waste recycling, *Livestock, *Agricultural wastes, Tanneries, Byproducts, Slaughtering houses wastes, Developing country application.

This monograph is intended to create an awareness among the students, the researchers, and the public about the anormous value of the various animal byproducts which are at present not fully utilized. It gives adequate coverage on availability, methods of collection, processing, and utilization of the important animal by-products emanating from slaughter houses and tanneries. A complete list of implements for processing of casings has also been provided. Suggestions for the development of a number of collagen based products, such as collagen sheets, tubes, powders, gels, etc., for use in different surgical situations, are indicated based on research at CLRI. It also provides information on 'wet' and 'dry' rendering techniques indicating their comparative merits and detailing the unit operations such as pre-breaking, hashing, washing, cooking, centrifuging, hydraulic pressing, grinding, and sacking.

PB83-133694/GAA PC **A08**/MF **A01**
Central Leather Research Inst., Madras (India).
Sports Goods Leather,
T. S. Ranganathan, and T. S. K. Mahadevan. 1982, 166p PROCESS BULL-3

Keywords: *Leather, Equipment, Chemical compounds, Additives, Developing country application.

In this report, processes are given in detail for the manufacture of various leather based sports goods items like football, cricketball, and hockeyball. All the processes standardized and published since the inception of the institute are reproduced which would give an idea of how the processes had to be modified with the changing needs and specifications. These processes are still relevant since they have been so worked out to satisfy the requirements of the industry in all the sectors, viz., cottage, small, medium, and large. The processes can always be adapted to the existing conditions and availability of various chemicals/auxiliaries needed for the manufacture of various items of sports goods leathers. In order to facilitate this, an appendix is given at the end, classifying and grouping the auxiliaries used. This should serve as a guide for choosing suitable alternative chemicals and auxiliaries. Suitable modifications in some of the processes have also been included at the end as an appendix.

PB83-133736/GAA PC **A06**/MF **A01**
Punjab Agricultural Univ., Ludhiana (India).
Investigation into Bovine Tropical Theileriasis.
Final rept. 1 Apr 73-30 Sep 78,
Y. Bhattacharyulu, Dharam Kaur, Amarjit Singh, H. L. Dass, and Avtar Singh Gill. 1978, 105p

Keywords: *Animal diseases, *Vaccines, Feasibility studies, Immunization, Cattle, *Veterinary medicine, Antigens, Developing country application, Chemotherapy.

Theileriasis has been the biggest problem of exotic animals as no specific treatment for established clinical cases is available. As chemotherapy of the disease is not available, the only hope of successfully raising exotic and cross-bred cattle and of keeping them productive for life, lies in evolving vaccine(s) against the disease. The main objective of the scheme was to investigate the feasibility of vaccinating cattle against tropical theileriasis (T. annulata). This objective has been fully achieved as the investigation has made available 'infection-treatment' method of immunizing cattle. It has shown that the vaccination provided complete protection against severe homologous infections, and full clinical protection against severe heterologous infections. Moreover, a highly virulent and pathogenic Indian strain of T. annulata was attenuated by serial passage in tissue culture, and it was demonstrated for the first time, that the immunity following vaccination with the attenuated strain was good against tick-transmitted infection.

PB83-134676/GAA PC **A03**/MF **A01**
Economic Research Service, Washington, DC. Natural Resource Economics Div.
Data Needs and Collection Methods for Analysis of Agricultural Production Potential,
John D. Sutton. May 82, 37p AGES-820427

Keywords: *Information sources, *Agriculture, *Productivity, Technical assistance, Foreign aid, Economic forecasting.

Concepts and methods used in five developing countries by the Comprehensive Resource Inventory and Evaluation System (CRIES) project for the collection of data needed in national/regional analysis of agricultural production potential are presented and discussed. Recommendations concerning data to be gathered and methods to be used in future USAID technical assistance programs are offered.

PB83-134700/GAA PC **A06**/MF **A01**
Economic Research Service, Washington, DC. Foreign Demand and Competition Div.
International Food Policy Issues: A Proceedings,
Joseph W. Willet. Jan 78, 107p FAER-143

Keywords: *Food, *International trade, Statistical analysis, *Agricultural economics, Problem solving, Food deprivation, Requirements, Security.

This document contains pages and commentary presented at the Conference on International Food Policies Issues, held in Washington, DC, April 28 and 29, 1977. The conference focused on important international trade and development issues under discussion in such international fora as the World Food Council, the Multilateral Trade Negotiations, the United Nations Conference on Trade and Development, and the International Wheat Council. Issues surrounding international food security, food needs of developing countries, and food aid and malnutrition are delineated and alternative solutions to problems are suggested.

PB83-135616/GAA PC **A08**/MF **A01**
Instituto Tecnico de Capacitacion y Productividad, Guatemala City.
Manual de Reforestacion. Nivel Medio (Reforestation Manual).
Jun 79, 160p INTECAP-81-007
Text in Spanish.

Keywords: *Soils, *Forestry, Manuals, Afforestation, Soil properties, Cultivation, Forest trees, Planting, Seeds, Selection, Equipment, Hand tools, Insects, Tropical regions, Guatemala, Developing country application, Reforestation.

The present 'Manual', written by the Forestry Section of INTECAP, is a compilation of forest and wood management techniques. Its contents include: soil selection and preparation, seed handling, tree planting and care, economy and care of machinery, and self-explanatory pictures and drawings.

PB83-135624/GAA PC **A04**/MF **A01**
Instituto Tecnico de Capacitacion y Productividad, Guatemala City.
Manual de Uso y Manejo de Aparatos Forestales (Forestry Tools Utilization Manual).
Apr 81, 73p INTECAP-81-008
Text in Spanish.

Keywords: *Hand tools, *Forestry, Manuals, Hand tools, Utilization, Describing, Measuring instruments, Guatemala, Developing country application, Hypometers.

In order to improve forestry management practices, some tools must be used. Some of these are very simple, while others require more skills for proper use, but all are necessary. This manual aims to teach forestry workers the correct use of tools like the hyprometer, hand levels, forester's compass, etc.

PB83-136119/GAA PC **A06**/MF **A01**
Jute Technological Research Labs., Calcutta (India).
Jute Technological Research Laboratories - Annual Report 1981.
1981, 108p
See also Annual Report for 1980, PB82-221102.

Keywords: *Jute, *Textile industry, Technology, Fibers, Manufacturing, Developing country application.

The main objectives of this institute have been to carry on technological research on jute and other long vegetable fibers for promoting the production of good quality fibers, upgrading the fiber and product quality, and finding diversified uses of plant fibers, their agricultural by-products and their industrial wastes. This report summarizes the research activities during the year. The major highlights of work done relate to pineapple leaf fiber; low cost technology for preparing good quality kraft paper from jute root cuttings; X-ray method for determining the blend composition of jute-rayon blended textiles; and dry carrier based culture of Aspergillus sp. for upgrading low quality bark jute.

PB83-136127/GAA PC **A02**/MF **A01**
Indian Pump Manufacturers Association, Bombay.
Guidelines for Selection of Agricultural Pumps.
1982, 16p

Keywords: *Water pumps, *Irrigation, Instructions, Selection, Size determination, Flow rate, Centrifugal pumps, Turbine pumps, Submersible pumps, Utilization, India, Developing country application.

Pumps used for lifting water to the fields from rivers, nallahs, canals, wells and underground streams the rate of flow for the pump has to be determined beforehand for selecting its size. The former has also to decide which type of pump, i.e. horizontal, centrifugal, vertical turbine or submersible would be suitable for economical use in the fields. This paper discusses in detail the various agricultural pumps and their proper usefulness.

PB83-136135/GAA PC **A03**/MF **A01**
Directorate of Building Research, Bandung (Indonesia).
Masalah Bangunan, Volume 25, Numbers 1-2, March-June 1980,
Albert Kartahardja, Bambang Panudju, K. N.
Ramamurthy, M. S. Mathews, and K. Jagajothi. Jun
80, 40p

Keywords: *Construction, *Housing, Construction materials, Housing studies, Evaluation, Urban renewal, Borth control, Earthquakes, Villages.

This publication on building and construction contains several articles which are entitled: Development of locally produced building materials in developing countries; Evaluation of housing programs in developing countries; Slum upgrading programme in Madras City-a case study; Earth and population control; The Lombok earthquake of 30 May 1979; Village of the future-a cure for urban overpopulation; Squatters of Dacca City; Undugu stands for brotherhood; and Some aspects on the management of human settlements.

PB83-136226/GAA PC **A03**/MF **A01**
Syracuse Research Corp., NY.
Clean Fuel from Bioconversion of Solar Energy.
Final rept. Jan 80-Oct 81,
S. D. Feighner, A. Rosenberg, L. Mason, H. C. Sikka,
and J. Saxena. Dec 81, 45p GRI-81/0057
Contract GRI-5014-361-0265

Keywords: *Bioconversion, *Algae, *Fuels, Enzymes, Bacteria, Cultures(Biology), Hydrogen, Methane.

This project is directed at attempting to exploit the well known phenomenon of glycolic acid production and excretion by certain unicellular green algae. Eventually, it is planned to couple a bacterial/enzyme system with the algal system to produce a useable fuel (e.g., hydrogen or methane).

PB83-136366/GAA PC **A05**/MF **A01**
National Research Council, Washington, DC.
Marine Technical Assistance to Developing Countries: The U.S. Role.
Final rept.
Nov 82, 99p
Sponsored in part by National Oceanic and Atmospheric Administration, Washington, DC., Department of the Navy, Washington, DC., Department of State, Washington, DC., and Agency for International Development, Washington, DC.

Keywords: *Marine engineering, Specialized training, *Technology transfer, Oceanography, Fisheries.

This report presents the findings of a study of marine technical assistance and cooperation in fisheries and oceanography. The Marine Technical Assistance Group (MTAG) Of The National Research Council's Ocean Policy Committee conducted the study to (1) assess the objectives of U.S. marine technical assistance and cooperation programs and the means that have been developed to achieve them; (2) project future needs of developing countries for marine technical cooperation; (3) assess U.S. capabilities to fulfill the requests of developing countries, and (4) recommend policies and mechanisms for future U.S. marine cooperative programs in light of evolving foreign policy objectives. For purposes of this study, marine technical assistance and cooperation were considered to include the transfer of marine-related technology and equipment; the education and training of marine scientists, technicians, and manager; educational exchange programs; and cooperative research and development programs in oceanography and fisheries, including inland fisheries and aquaculture.

PB83-137000/GAA PC **A07**/MF **A01**
Kansas State Univ., Manhattan.
Appropriate Technology of Alternative Agricultural Practices on Drylands.
Final rept. 15 Aug 80-15 Aug 82,
M. B. Kirkham. 1982, 146p* NSF/CEE-82055
Grant NSF-ISP80-14715
Portions of this document are not fully legible.

Keywords: *Crops, *Waste recycling, *Fertilizers, Production, Farm crops, Vegetation, Plant growth, Yield, Comparison, Oklahoma, Soil stabilization, Arid land, Kansas, Wheat plants, Grain sorghum plants.

Results are presented of a project undertaken to determine whether agricultural productivity on land treated with sewage sludge was different from that of land treated with inorganic fertilizer. Two sites were selected: (1) a farm in southcentral Oklahoma which had been overgrazed; and (2) a farm in east-central Kansas where winter wheat and sorghum were grown. Plants grown with sludge were taller, had a larger leaf area, and had a higher dry weight than plants grown with inorganic fertilizer. Plants grown with sludge and those grown with inorganic fertilizer yielded the same amount of grain.

PB83-137489/GAA PC **A02**/MF **A01**
Ahmedabad Textile Industry's Research Association (India).
Seminar Report on Productivity Analysis: A Management Tool for Planned Progress,
A. R. Garde. Jan 76, 25p
Portions of this document are not fully legible.

Keywords: *Productivity, *Textile industry, Production management, India, Management methods, Developing country application.

Suitable indices of productivity which permit interfirm comparison and also give an overall assessment of an individual mill were evolved. These indices have been under constant review and have recently been modified to render them capable of direct interpretations and make them diagnostic in nature so that the main index and the sub-indices can indicate the area of deficiency, if any. This paper discusses in detail these improved methods of productivity measurement and analysis and shows how the indices can be used for estimating the relative contribution of each cause of low productivity to the total shortfall in productivity.

PB83-138560/GAA PC **A16**/MF **A01**
Weston (Roy F.), Inc., West Chester, PA.
Operation and Maintenance Considerations for Land Treatment Systems,
Final rept.
Jan 82, 352p EPA-600/2-82-039
Contract EPA-68-03-2775
See also PB-299 655.

Keywords: *Land use, *Sewage treatment, *Irrigation, Municipalities, Field tests, Permeabiltiy, Fluid filtration, Flow rate, Maintenance, Operating costs, Design, Sites, Layout, Mississippi, California, Overland flow.

The objective of this study was to focus on strategies and problems associated with the operation and maintenance of the three major types of land application systems, i.e., slow rate, rapid infiltration, and overland flow. In addition, the effect of various methods and levels of pretreatment prior to land application were studied. 28 land application sites throughout the United States were visited.

PB83-138636/GAA PC **A08**/MF **A01**
National Research Council, Washington, DC.
Quality Criteria for Water Reuse.
Final rept.
Aug 82, 153p* ISBN-0-309-03326-8
Contract EPA-68-01-3169, Contract DACW31-76-C-0069
Library of Congress catalog card no. 82-61430. Sponsored in part by Department of Agriculture, Washington, DC.

Keywords: *Potable water, *Waste water reuse, *Water quality, *Sewage treatment, Tests, Chemical analysis, Microbiology, Toxicology, Evaluation, In vitro analysis, Comparison, Viruses, Bacteria, Organic compounds, Inorganic compounds, Metals, Toxicity, Risk, Trace elements, Comparison, Standards, Reverse osmosis.

The report concludes that there is a critical need to evaluate reused water chemically, microbiologically, and toxicologically, and that the most practical way to make judgments about the potential health hazards of reused water is to compare it with conventional supplies with risks, if any, that are presumed to be acceptable. The initial comparisons of conventional with reused water should be done on the basis of identifiable individual compounds and microbiological organisms. The results of these tests would determine the need to proceed with additional testing and would indicate whether or not the reused water was 'as safe as' a generally accepted conventional supply.

PB83-139725/GAA PC **A20**/MF **A01**
Development Planning and Research Associates, Inc., Manhattan, KS.
Economic Impact Analysis of Effluent Limitations and Standards for the Textile Mills Industry.
Final rept.,
Donald J. Wissman, Richard E. Seltzer, and Arthur C.
Barker. Aug 82, 468p* EPA-440/2-82-001
Contract EPA-68-01-4632

Keywords: *Textile industry, *Water pollution, *Economic analysis, Water pollution standards, Financing, Technology, Employment, Shutdowns, Profits, Cost estimates, Tables(Data), Industrial shutdowns.

The US Environmental Protection Agency issued effluent guidelines and limitations for the Textile Mills Industry in September 1982. This report estimates the economic impact of pollution control costs in terms of price changes, effects on profitability, potential plant closures, unemployment, and other secondary effects. A model plant approach is used to assess these impacts for nine subcategories, which are based on size of plant and type of textile process.

PB83-139790/GAA PC **A06**/MF **A01**
Stanford Univ., CA. Inst. for Communication Research.
Improving the Diffusion of Mass Transportation Innovations.
Final rept.,
Kathleen P. Magill, Everett M. Rogers, and Thomas
Shanks. Jun 81, 121p UMTA-CA-06-0115-81-1
Contract UMTA-CA-06-0115

Keywords: *Technology transfer, *Transportation, National government, Local government, Urban transportation, Technology innovation, Research projects, Decision making.

The Office of Service and Methods Demonstration (SMD) diffusion system is a technology transfer system in which Federally-sponsored research results are put into use by local governments. The purposes of this report are to summarize the main findings and to discuss the policy implications from a three-year investigation of the diffusion and implementation of urban mass transportation innovations that was conducted at the Institute for Communication Research at Stanford University. The objectives of the three-year research project were: (1) to describe the nature of the innovation process for urban mass transportation innovations; (2) to assess the role of demonstrations and other Federally-sponsored interventions in the diffusion of urban mass transportation innovations; and (3) to identify and evaluate alternative methods of disseminating information, such as brochures, dissemination conferences, etc., about urban mass transportation innovations. This project investigated the process through which local public organizations learn about, evaluate, adopt (or reject), and implement innovations which are of interest to SMD. Implications are presented for improvement of the SMD diffusion system, based on research results from investigating the diffusion of Dial-A-Ride, vanpooling, auto-restricted zones, and priority lanes for high-occupancy vehicles.

PB83-139899/GAA PC **A17**/MF **A01**
PRC Toups, Orange, CA.
Evaluation of Desalination Technology for Wastewater Reuse.
Final rept.
Aug 82, 388p* W83-01270, , OWRT/RU-82/8
Contract DI-14-34-0001-7802

Keywords: *Desalination, *Water pollution, Recirculation, Technology, *Sewage treatment, Industrial waste treatment, Agricultural wastes, Electrodialysis, Ion exchanging, Evaporation, Freezing, Cost analysis, Performance evaluation, *Waste water reuse, Ultrafiltration, Reverse osmosis.

As environmental constraints on wastewater discharge become more rigorous, desalting techniques are beginning to find application in effluent treatment processes. Applications of desalination technology to the treatment of municipal, industrial and agricultural wastewaters for reuse are beginning to occur. A survey of potential and existing applications of wastewaters using current desalination technology was conducted. The processes considered include reverse osmosis, electrodialysis, ion exchange, evaporation, freezing, and ultrafiltration. Standard Treatment Systems for desalination of wastewater have been developed to enable potential users to identify process requirements and costs for specific wastewaters. Industrial, agricultural and municipal wastewater desalination and reuse is technically possible. The relatively high capital, operational and maintenance costs of desalination processes are the primary deterrents to widespread application. However, as wastewater discharge limitations become increasingly restrictive, desalination processes may be economically competitive. Industry is the largest potential user of wastewater desalination and reuse systems. The potential for potable reuse of any wastewater is relatively low due to potentially adverse health effects. Non-potable reuse of municipal wastewaters has average potential in areas with costly or limited water supplies. Industry could use both municipal and agricultural wastewaters in areas with expensive or limited water supplies. The reuse of wastewater for agriculture would greatly increase the costs of food crops.

PB83-140186/GAA PC **A03**/MF **A01**
National Bureau of Standards, Washington, DC.
Guide for the Construction and Operation of Drill-Up,
Kenneth W. Yee. Oct 82, 29p NBSIR-82-2590.

Keywords: Breaking load, *Machine tools, Automatic control equipment, User needs, Computer programs, DRILLUP computer program, Computer applications.

This guide provides detailed information for the construction of a single-speed version of Drill-Up and instructions for its installation and operation. Drill-Up is an instrument designed to prevent breakage of small-diameter drills used on automatic-feed drilling machines with a spindle retract ability. The method and applications have been previously described in the references given. The hardware and software necessary to construct an instrument for use at a single selected drilling speed are described. The circuit diagram and source program are included.

PB83-140269/GAA PC **A10**/MF **A01**
National Research Council, Washington, DC. Advisory Board on Military Personnel Supplies.
Microbiological Safety of Foods in Feeding Systems.
1982, 213p ABMPS-125
Contract DAAK60-79-C-0015

Keywords: *Microbiology, *Food services, *Food processing, Hazards, Food deterioration, Staphylococcal infections, Salmonella, Clostridium botulinum, Food preparation, Food storage, Viruses, Temperature, Frozen foods, Education, Food poisoning.

The Committee on Microbiology of Food of the Advisory Board on Military Personnel Supplies (ABMPS) of the National Research Council was formed to advise the U.S. Army Natick Research and Development Laboratories on military research and development related to microbiology of food. The first task of the committee was to plan, organize, and conduct a workshop on microbiological safety of foods in feeding systems with the objectives: (1) to enhance the awareness of existing and potential microbiological problems in food service and their solutions, and (2) to examine possible contributions of microbiological studies to the proper development, packaging, storage, distribution, preparation, and serving of military foods. The second task was to prepare recommendations for the military based on analysis of the presentations and discussions.

PB83-140525/GAA PC **A03**/MF **A01**
International Crops Research Inst. for the Semi-Arid Tropics, Patancheru (India).
Chickpea and Pigeonpea Diseases: Resistance-Screening Techniques,
Y. L. Nene, M. P. Haware, M. V. Reddy, and J. Kannaiyan. Oct 81, 36p IB-10, IB-9
Abstracts in English and French.Color illustrations reproduced in black and white.

Keywords: *Leguminous plants, *Plant diseases, Plant pathology, Plant viruses, Rust(Fungi), Tolerances(Physiology), Identifying, *India, Developing country application, Cajanus cajan, Pigeonpea, Cicer arietium, Chickpea.

Over 50 diseases have been reported to affect pigeonpea (Cajanus cajan) a widely grown tropical legume crop. Economically important diseases are wilt, Phytophthora blight, sterility mosaic, witches' broom and rust. To assist plant breeders develop disease-resistant material, easy and effective techniques to screen germplasm and breeding material have been developed and standardized for some diseases. More than 50 pathogens have been reported to affect chickpea (Cicer Arietium) an important legume crop in many parts of the tropics and subtropics. Several pathogens are of economic importance, particularly wilt, dry root rot and Ascochyta blight. To assist plant breeders to develop disease resistant material, techniques have been worked out and standardized to screen germplasm and breeding material on a routine basis. These techniques are described in detail and a nine-point rating scale is given in the report.

PB83-140533/GAA PC **A03**/MF **A01**
National Safety Council, Hyderabad (India). Andhra Pradesh Chapter.
Safety Rules, Part I.
Mar 82, 47p

Keywords: *Occupational Safety and Health, *Industrial plants, *Safety, Safety devices, Manuals, Injuries, Safety engineering, Developing country application.

The industrial activity of diverse nature involving machinery, tools, equipment, and the processes employed therein pose potential dangers to man, machine, and production. This report concentrates mainly on the safety rules to be followed in various operations. Separate chapters are devoted to manual work, hand trucks, fork lift trucks, slingers, cranes, and stacking materials. The manual gives simple common rules to be kept in mind while engaging in the above operations. It includes preventive measures and effective ways of rectifying mistakes committed. This illustrated manual is aimed at the industrial world and all those who are partners in ensuring safety.

PB83-140541/GAA PC **A03**/MF **A01**
International Crops Research Inst. for the Semi-Arid Tropics, Patancheru (India).
Yield Risk, Risk Aversion and Genotype Selection - Conceptual Issues and Approaches,
Hans P. Binswanger, and B. C. Barah. Nov 80, 31p RB-3

Keywords: *Technology transfer, *Plants(Botany), Yield, Selection, Plant growth, Risk, Regression analysis, Ranking, India, Developing country application.

This paper deals with yield risks of different genotypes or, conversely, their stability over time. It also deals with adaptability of genotypes over space. Several methods of stability and adaptability analysis where stability here has a risk connotation are discussed. For risk analysis it is proposed to measure stability by standard deviation and risk preferences by the tradeoff between standard deviation and mean yield. This leads to a unique preference-based ranking for choosing among genotypes for decision makers with given risk preferences. This ranking takes into account both (temporal) stability and mean yield. A practical way of measuring risk with several years of coordinated yield trial data is then proposed.

PB83-141341/GAA PC **A04**/MF **A01**
Swedish Council for Building Research, Stockholm.
Energy in Physical Planning: An Approach to Calculating Energy Requirements for Heating, Transportation and Other Forms of Infrastructure,
Johan Lamm, Bernt Nielsen, and Peter Wennerhag. 1982, 59p D18: 1982

Keywords: *Energy, *Housing, *Urban planning, Housing planning, *Transportation, Water supply, Waste disposal, Illuminating, Electric power demand, Decision making.

In a study entitled Energy in Physical Planning. An approach to calculating energy requirements for heating, transportation and other forms of infrastructure a method is presented for making tentative calculations on the use of energy in various physical structures. The present report contains a series of cases which indicate how the energy consumption in a given area can be determined and provide basic data for various planning and decision-making situations.

PB83-142075/GAA PC **A06**/MF **A01**
National Safety Council, Hyderabad (India). Andhra Pradesh Chapter.
Safety Training in Industry.
1982, 104p

Keywords: *Occupational Safety and Health, *Industrial plants, *Safety, *Training, Safety devices, Manuals, Injuries, Safety engineering, Developing country application.

Training of personnel has become a necessity to ensure smooth running of any organization. Training of personnel in industrial safety is very important, when handling modern machinery and equipment and sophisticated instruments. This manual is an effort to meet the requirements of training managers, supervisors, and personnel concerned with industrial safety. The first part deals with training function, assessing training needs, training process, methods employed in training, the audio-visual aids used in classroom situation, the problems of training adults, and the feedback and evaluation in training. The second part is oriented to organizing training in industrial safety. This manual will be found useful by all those who are connected with training in industrial safety.

PB83-142083/GAA PC **A04**/MF **A01**
National Safety Council, Hyderabad (India). Andhra Pradesh Chapter.
Disaster Planning in Industry.
Dec 81, 71p

Keywords: *Occupational Safety and Health, *Safety, *Industrial plants, Industrial accidents, Safety devices, Injuries, Planning, Developing country application.

Every industry is exposed to threat of disasters both man-made and natural due to a variety of causes such as floods, fires, earthquakes, volcanic eruption and other calamities. This manual is a guide to avert such disasters and to put the industry back on the rails very quickly. Initially it outlines a general disaster plan detailing the steps to be taken in case of any crisis. Then follow specific plans for fire/explosion, accidental emission of toxic and hazardous substances, food poisoning. Checklists and manuals which are to serve as guides in case of power and other failures, storms, earthquakes and personal injuries are also provided. One section is devoted to future safety measures.

PB83-142695/GAA PC **A04**/MF **A01**
Tribhuvan Univ., Kathmandu (Nepal). Research Centre for Applied Science and Technology.
Sample Survey of Traditional Water Wheels and Small Water Turbines in Nepal: A Preliminary Report,
Chandra Bahadur Joshi. 1981, 51p

Keywords: *Turbines, *Water use, *Hydrology, Surveys, Assessments, Nepal, Developing countries, Developing country application.

The main purposes of this survey were to study the technical, economical, and social aspects of water wheels and turbines; to assess the possibility of developing these modern and traditional technologies together or improving them separately; to assess the awareness of the local people of the need for improvement on their existing technologies; and to find out the possible role of RECAST for mutual cooperation. This survey is intended to provide planners financiers, researchers, and manufacturers with further information regarding better use of small hydro resources and locally available skills for development.

PB83-144485/GAA PC **A09**/MF **A01**
Wilmington Coll., OH.

Value Added Tax and Small Business.
Final rept.,
Charles F. Palmer. 1982, 187p
Contract SBA-2650-OA-79

Keywords: *Taxes, Competition, Economic impact, Fixed investment, Losses, Corporations, Income taxes, Incentives, *Small businesses, Tax credits.

This research brings together information on the impact of the value added tax by (1) researching the catalog of literature; (2) analyzing the implications of a value added tax on small business; (3) investigating empirically and indepth the hypothesis that the competitive position of small business would be improved if other taxes were replaced by the value added tax.

PB83-144725/GAA PC **A04**/MF **A01**
Massachusetts Univ., Amherst. Dept. of Mechanical Engineering.
Design for Manufacturability. Report Number 16. Data Sheets and Case Study for Manual Assembly,
T. Fujita, and G. Boothroyd. Apr 82, 70p NSF/MEA-82009
Grant NSF-APR77-10197
See also PB82-194143.

Keywords: *Management techniques, *Productivity, *Industrial plants, Cost control, Fasteners, Design criteria, Production rate, Production control, Human factors engineering, Value engineering.

The importance of fastener selection in reducing product costs is discussed and examples of cost effective fasteners are given. Data sheets are provided for information about the effects of various design features on handling and assembly time to be used to estimate part features at the design stage. A manual assembly case study on a riser panel subassembly is included. The study indicates that the application of the proposed method can result in an increase in assembly labor productivity for only a small investment in designer or product engineering time. The appendixes contain: (1) a classification system for products or assemblies; (2) an analysis of design for manual assembly and difficulty levels for manual handling and manual assembly processes; and (3) design parameters for manual handling and assembly.

PB83-144956/GAA PC **A02**/MF **A01**
Indian Inst. of Horticultural Research, Bangalore.
Control of Kagzi Lime Decline.
1982, 10p EXTENSION BULL-26

Keywords: *Plant diseases, *Fruits, Plant viruses, Cultivation, Tolerances(Physiology), Protection, Control, India, Developing country application, Tristeza.

The Common lime, variously known as Key, Mexican, West Indian, Galago, Kagzi etc., has in recent years suffered a serious setback as a result of a serious malady referred to as 'die-back' or 'decline'. The principal component of this malady is a Tristeza virus. This report concentrates on the way in which the Trizteza virus affects the Kagzi lime, the symptoms by which it is identified, the transmission of the virus and strains of Tristeza. Control measures like Cross Protection and inoculation Technique to protect Kagzi lime is also dealt with.

PB83-145045/GAA PC **A18**/MF **A01**
National Research Council, Washington, DC.
International Cooperation in Marine Technology, Science, and Fisheries: The Future U.S. Role in Development - Proceedings of a Workshop, January 18-22, 1981, Scripps Institution of Oceanography, La Jolla, California.
May 81, 402p
Contract NA79AA-D-00135, Grant AID/DSAN-G-0168
Library of Congress catalog card no. 81-82188. Sponsored in part by Department of State, Washington, DC., and Department of the Navy, Washington, DC.

Keywords: *Fisheries, *Aquaculture, Technology transfer, Fishing, Developing countries, Remote sensing, Coasts, Shore protection, Law(Jurisprudence), Water pollution, Energy, Education, Government policies, United States, *Technical assistance.

The Ocean Policy Committee has maintained a continuing interest in the nature and effectiveness of U.S. programs of marine technical assistance and cooperation. In 1979 the committee established the Marine Technical Assistance Group to undertake four related tasks: (1) to assess the relationship between the objectives of marine technical assistance and cooperative programs and the means that have been developed to achieve them; (2) to project future U.S. policy objectives and future needs of developing countries for marine technical cooperation; (3) to assess U.S. capabilities to meet its objectives and fulfill the needs of developing countries, and (4) to recommend policies and mechanisms for future U.S. programs of marine technical assistance and cooperation. Marine science is closely tied to fisheries in many developing countries.

PB83-145201/GAA PC **A03**/MF **A01**
Indian Inst. of Horticultural Research, Bangalore.
Grape Cultivation.
1982, 37p EXTENSION BULL-15

Keywords: *Crops, *Fruits, *Environmental impacts, Climate, Soil properties, Plant reproduction, Planting, Layout, Cutting, Weed control, Insects, Plant diseases, Plant nutrition, India, Developing country application.

This report of Grape Cultivation concentrates on the climate and soil in which the grape is grown, the different varieties of Grape, propagation, layout, spacing, planting, training, pruning, manuring schedule, irrigation, etc. Measures for weed control, improving berry and bunch quality, harvesting are also dealt with briefly.

PB83-145219/GAA PC **A03**/MF **A01**
Indian Inst. of Horticultural Research, Bangalore.
Guava Cultivation and Banana Cultivation in India.
1982, 27p EXTENSION BULL-20

Keywords: *Fruits, *Crops, Climate, Soil properties, Plant propagation, Irrigation, Plant diseases, Insects, Fertilizers, Harvesting, Food preparation, *India, Developing country application, Guava, Bananas.

Guava is one of the most familiar fruits in India and assumes special importance because of the hardy nature of the plant. Soil and climate in which Guava is grown, the different varieties of Guava, the nursery practices adopted like budding, grafting, stooling and air-layering, irrigation, manuring, harvesting and yield are dealth with in this report. Banana is one of the oldest fruits cultivated by man. This report on banana cultivation in India deals with the soil and climatic conditions, varieties of the fruit, fertilizer application, irrigation and weed control measures.

PB83-145896/GAA PC **A05**/MF **A01**
National Research Council, Washington, DC.
Estimation of Recent Trends in Fertility and Mortality in the Republic of Korea.
Committee on Population and Demography rept. no. 1 (Final),
Ansley J. Coale, Lee-Jay Cho, and Noreen Goldman. 1980, 93p ISBN-0-309-02890-6
Contract AID/pha-C-1161
Library of Congress catalog card no. 79-22705.

Keywords: *South Korea, *Fertility, Surveys, Trends, Estimates, Population growth, Tables(Data), Birth rate.

This report contains sections on (1) Estimation of fertility, 1955-1975, by adjustment of own-children calculations; (2) Estimation of fertility, 1971-1975, from registered births adjusted for underregistration; (3) Estimation of fertility from special surveys; (4) Estimation of mortality; (5) Adjustment of own-children fertility estimates by correction of female age distributions in Korean censuses; (6) The female age distribution of Korea in 1975 as recorded in the complete count and in the 5-percent sample; and (7) Comparison of average increases in parity from 1970 to 1975 (census cohort birth rate) with number of registered births per woman (registered cohort intercensal birth rate).

PB83-146126/GAA PC **A10**/MF **A01**
Central Sheep and Wool Research Inst., Avikanagar (India).
All India Coordinated Research Project on Sheep Breeding.
Project Coodinators rept. 1 Apr 81-Sep 82.
Sep 82, 221p
See also PB82-239583.Portions of this document are not fully legible.

Keywords: *Animal husbandry, *Ruminants, Genetics, Wool, Meat, Growth, Survival, Mortality, India, Developing country application.

The All India Coordinated Research Project was launched with a view to undertake research on augmenting wool and mutton production. The main objectives of this project are: Evolving new fine wool breed of sheep suitable for different agro-climatic conditions; evolving new mutton sheep breeds; to create superior carpet wool breed; and conducting ancillary studies on sheep physiology. This report describes in detail the progress and results obtained during the 18 month period.

PB83-146399/GAA PC **A05**/MF **A01**
Hawaii Univ. at Manoa, Honolulu. Water Resources Research Center.
Water Transfer Strategy: Energy vs. Agricultural Use.
Technical rept.,
Y.-S. Fok, and C.-P. Chang. Mar 82, 80p TR-142, W83-01358, , OWRT-B-060-HI(1)
Contract DI-14-34-0001-9110

Keywords: *Energy source development, *Irrigation, *Arid land, Water rights, Industries, Water consumption, Social effect, Economic factors, Cost analysis, Energy development, Irrigation water.

In some arid and semiarid regions where most water is appropriated for irrigation, water has been recognized as the most important limiting factor for energy development. Therefore, a water transfer from agricultural to energy use should be considered, since industry yields the highest value of water and thus constitutes the highest productivity. A transfer of the available water from agriculture to industry or energy in communities which are basically agricultural would tend to upset the familiar pattern of life and would result in a number of social costs to farmers and third parties. The required acreage of transferred irrigated lands increases as the total energy requirement increases. To decrease the energy cost of agricultural water right reimbursement, energy developers can sell over-transferred water rights to downstream users from the reach where no more energy water is needed.

PB83-146746/GAA PC **A09**/MF **A01**
Dow Chemical U.S.A., Walnut Creek, CA.
Development of New Cleaning Techniques for Reverse Osmosis Membranes,
Jolaine A. Johnson, and Thomas M. Leahy. 30 Mar 82, 186p W83-01369, , OWRT-C-80152-S(8519)(1)
Contract EPA-14-34-0001-8519

Keywords: *Desalination, Cost analysis, Cleaning, Comparison, Performance evaluation, Brackish water.

Reverse osmosis permeators are susceptible to fouling by suspended solids in the feedwater. Several cleaning methods for the control of silt fouling were tested and compared. The flow reversal cleaning method, where a permeator flush stream is periodically switched from a feed-to-brine to a brine-to-feed flow direction, appeared the most effective of the methods tested. When cleaning techniques were combined, cleaning effectiveness was improved slightly. The addition of a surfactant to the cleaning flush stream improved the effectiveness of all of the cleaning methods by an average of 55%. Comparison of performance results between separate testing phases indicates that experimental operating conditions were not consistent between phases. It is believed that the installation of a cleaning system may allow operation on a feedwater with higher than presently acceptable fouling potential, and membrane lifetime may be improved. The availability of an on-line cleaning system may prevent the necessity of membrane replacement in the event of severe pretreatment system upsets.

PB83-146753/GAA PC **A07**/MF **A01**
Biphase Energy Systems, Santa Monica, CA.
Desalination-Power Cycles with the Biphase Rotary Separator Turbine, Phase 3.
Final rept.,
Paul L. Limburg, Edward Walsh, and Daniel Rovener. Feb 82, 131p W83-01370, , OWRT-C-00156-D(0490)(1)
Contract DI-14-34-0001-0490
See also PB81-150237 Color illustrations reproduced in black and white.

Keywords: *Desalination, Separation, Sea water, Performance evaluation, Scale(Corrosion), Corrosion, Design criteria, Feasibility, Energy recovery.

Tests of a fluidized-bed seawater heat exchanger showed that 330F was the maximum temperature to which seawater could be heated without scale formation in the bed during once through flow of seawater. Twelve material and coating combinations were exposed to a two-phase salt-water jet to simulate the environment of rotary-separator-turbine rotor materials. The materials, except for bare aluminum and some brittle coatings, passed four-hour screening tests. A hydraulic version of the Biphase reaction turbine can recover reverse-osmosis reject-brine pressure energy with efficiency of over 70%. A two-phase version can recover pressure energy and provide additional power for pumping from a waste heat source. Integration of a high-pressure reverse-osmosis pump into the turbine is not as efficient as using a separate pump and turbine coupled together. A system configuration was developed for a desalination-power system which uses the waste heat from diesel engines in the power plant at San Nicolas Island, CA.

PB83-147124/GAA PC **A18**/MF **A01**
International Crops Research Inst. for the Semi-Arid Tropics, Hyderabad (India).
Proceedings of the International Workshop on Intercropping Held at Hyderabad, India on January 10-13, 1979,
R. W. Willey. Jan 79, 402p
Abstracts in English and French.

Keywords: *Farming, *Agriculture, *Plants(Botany), Plant physiology, Grain sorghum plants, Pest control, Nitrogen, Weed control, India, Brazil, Africa, Developing country application.

This report on intercropping has four main sections viz. agronomy, physiological aspects, plant protection, and evaluation of intercropping systems. Topics include management practices for intercropping, maximizing production in intercropping systems like Sorghum/pigeon pea system, maize/bean, finger millet/groundnut mixtures and the evaluation of genotypes in intercropping. The final session undertakes an evaluation of intercropping systems and the improvements to be made in intercropping research.

PB83-147256/GAA PC **A02**/MF **A01**
International Crops Research Inst. for the Semi-Arid Tropics, Hyderabad (India).
Growth and Development of the Pearl Millet Plant.
Research bulletin no. 6,
R. K. Maiti, and F. R. Bidinger. Oct 81, 18p
Abstracts in English and French.Color illustrations reproduced in black and white.

Keywords: *Grains(Food), *Crops, *Plants(Botany), *Tropical regions, Plant anatomy, Morphology, Plant physiology, India, Developing country application, Pennisetum americanum, Pearl millet.

Pearl millet (Pennisetum americanum) is one of the most important food crops in the drier semi-arid tropics. The bulletin describes its three major growth phases: the vegetative phase, from emergence to panicle initiation of the main stem; the panicle development phase from panicle initiation to flowering in the main stem; and the grain-filling phase, from flowering to physiological maturity. Each phase has been subdivided to make a total of nine morphologically distinct and recognizable growth stages. Descriptions and characteristics to identify each of these stages are given. The bulletin also describes the growth and development of the major plant parts. The data given are derived from several years of research on the physiology of the crop.

PB83-147272/GAA PC **A02**/MF **A01**
Bureau of Reclamation, Denver, CO. Engineering and Research Center.
Development of an Automated Plugging Factor Monitor.
R. J. Eisenhauer, and C. G. Goodner. Dec 81, 18p
REC-ERC-81-12

Keywords: *Desalination, Design criteria, Performance evaluation, Monitors.

Efficient and economical control of a reverse osmosis membrane water desalting process is dependent on rapid, repetitive, and correct monitoring of the feedwater parameter called the 'plugging factor.' Several test devices are available to plant operators for monitoring the feedwater plugging factor. Operation of these devices requires much close manual attention every day, and the accuracy of results sometimes varies. A totally automatic plugging factor test assembly was designed, fabricated, and demonstrated. Water samples can be selected and passed through the plugging factor tester every 20 minutes, with plugging factor accuracies within + or - 0.4 percent.

PB83-147439/GAA PC **A02**/MF **A01**
Centre for Water Resources Development and Management, Kunnamangalam (India).
Development of Water Lifting Device.
Jan 81, 15p CWRDM/TR/0011, GW/R-8/1981

Keywords: *Water Pumps, *Water supply, *India, Design, Efficiency, Piston pumps, Pumping, Operations, Hand tools, Developing country application.

This report gives the details of a foot cum hand pump which has been developed. The existing foot pump (commercially available) can be operated by foot alone, which may not be convenient to all and also needs higher energy input. Modification has been made in the existing foot pump so as to enable it to be operated by hand also instead of by foot alone.

PB83-147728/GAA PC **A07**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Photovoltaics: Technological Progress and Its Future in Agriculture.
Staff rept.,
Walter G. Heid, Jr. Nov 82, 129p AGES-820707

Keywords: *Photovoltaic power system, *Agriculture, *Energy source development, Utilization, Photovoltaic cells, Technology, Government policies, Marketing, International trade, Energy sources.

Advances in photovoltaic technology are rapidly bringing it into the range of competitiveness with conventional and other alternative energy source. Photovoltaic systems can be used for nearly all of agriculture's stationary power needs, including energy to operate appliances and to heat farm homes. It is an appropriate technology for small as well as larger sized farms. As researchers and farmers weigh future alternative energy choices, photovoltaic systems should be included in their economic comparisons.

PB83-149450/GAA PC **A22**/MF **A01**
National Bureau of Standards, Washington, DC. National Measurement Lab.
Innovation for Maintenance Technology Improvements (MFPG). Proceedings of the Meeting of the Mechanical Failures Prevention Group (33rd), Held at the National Bureau of Standards, Gaithersburg, MD., April 21-23, 1981.
Final rept.,
T. Robert Shives, and William A. Willard. Oct 82, 511p NBS-SP-640
Library of Congress catalog card no. 82-600598. Sponsored in part by Naval Systems Command, Washington, DC., Office of Naval Research, Arlington, VA., and National Aeronautics and Space Administration, Greenbelt, MD.Goddard Space Flight Center. See also PB82-120304.

Keywords: *Maintenance, Maintenance management, Lubrication, Reliability, Manpower utilization, Fault detection.

These proceedings consist of a group of 34 submitted entries (32 papers and 2 abstracts) from the 33rd meeting of the Mechanical Failures Prevention Group which was held at the National Bureau of Standards, Gaithersburg, Maryland, April 21-23, 1981. The subject of the symposium was maintenance technology improvement through innovation. Areas of special emphasis included maintenance concepts, maintenance analysis systems, improved maintenance processes, innovative maintenance diagnostics and maintenance indicators, and technology improvements for power plant applications.

PB83-150250/GAA PC **A03**/MF **A01**
Auburn Univ., AL.
Oxygen Transfer Calculations for a Tractor-Powered Paddlewheel Aerator.
Master's thesis,
Martin Stuart Armstrong. 18 Mar 82, 37p W83-01619, , OWRT-B-076-ALA(12)

Keywords: *Aquaculture, *Oxygen, Dissolved gases, Catfishes, Spraying, Paddles, Tractors, Depth, Tests, Theses, Oxygen transfer, Paddle wheels.

The economic success of commercial channel catfish production requires high stocking densities and feeding rates. At feeding rates of 45 kg/hectare per day and greater, emergency aeration is occasionally required to prevent fish kills during periods of low dissolved oxygen. Paddlewheel aerators powered by farm tractors are widely used by catfish farmers. Standard aeration tests were conducted to establish oxygen transfer coefficients and rates for a paddlewheel aerator operated at different speeds and paddle depths.

PB83-150441/GAA PC **A08**/MF **A01**
Center for Natural Areas, South Gardiner, ME.
Handbook for Protection of Fish and Wildlife from Construction of Farm and Forest Roads; Best Management Practices for Building Activities Associated with the Discharge of Dredged or Fill Material.
Final rept.,
James Hynson, Paul Adamus, Stephen Tibbetts, and Rezneat Darnell. Jul 82, 167p FWS/OBS-82/18
Contract DI-14-16-0009-067

Keywords: *Fishes, *Construction, *Roads, Handbooks, Erosion control, Slope protection, Bridges, Culverts, Design, Maintenance, Soil conservation, Best management practices.

This Handbook describes 54 best management practices which may be utilized by Federal and State agencies or private landowners and operators in the review of project plans and in the planning, construction, and maintenance of farm and forest roads. Best management practices (BMPs) for planning road and facility layout and design, erosion control, construction and maintenance operations, and restoration to natural conditions. Based on the results of the evaluation, BMPs were modified or augmented with other practices to enhance their overall effectiveness and to provide for protection and propagation of fish and wildlife resources.

PB83-150839/GAA PC **A03**/MF **A01**
Foreign Agricultural Service, Washington, DC.
Horticultural Products Review.
Foreign agriculture circular.
Aug 82, 34p FHORT-2-82

Keywords: *Agricultural economics, *Marketing, Commodities, Exports, Nuts(Fruits).

The report contains information on market access and opportunities, market promotion activities, commodity updates, U.S. exports of selected horticultural products. It also has articles on 'Canada, Number One Market'; Pineapple Situation; Brazil Nut and Cashew Situation; and Indonesia - Potential for Expansion.

PB83-150938/GAA PC **A13**/MF **A01**
National Dairy Research Inst., Karnal (India).
National Dairy Research Institute Annual Report 1981,
M. S. Srivastava, and Rajbir D. Deswal. 1982, 286p
See also PB82-206699.

Keywords: *Dairies, *Management techniques, *Animal husbandry, *India, Dairy products, Management, Dairy cattle, Animal nutrition, Microbiology, Animal physiology, Animal diseases, Genetics, State government, Education, Developing country application.

The report begins with general information about the Institute's history and objectives. Highlights of research in the following nine divisions are given: dairy microbiology division, dairy chemistry division, dairy engineering division, dairy cattle genetics and breeding division, dairy cattle nutrition and physiology division, dairy technology division, dairy economics, statistics and management division, dairy extension division, and human nutrition dietetics division.

PB83-152207/GAA PC **A02**/MF **A01**
Pacific Southwest Forest and Range Experiment Station, Berkeley, CA.
Using Goats to Control Brush Regrowth on Fuelbreaks.
Forest Service general technical rept. (Final),
Lisle R. Green, and Leonard A. Newell. 1982, 21p
FSGTR-PSW-59

Keywords: *Fire safety, *Weed control, *Forestry, *Safety, *Ruminants, Diets, Fuels, Shrubs, Fire fighting, Safety, Damage, Plants(Botany), Predators, Spanish goats.

On fuelbreaks, herbicides have been the primary tool for controlling brush regrowth. Vegetation of low volume and low growth is maintained on these wide strips as an aid to firefighting safety. Goats are a promising alternative to herbicides, and may be the best tool available for controlling brush regrowth on fuelbreaks. They eat a wider variety of plants, and more woody plants, than other livestock. They are less selective on first-year brush regrowth, and more selective as brush is older. Goats should not be expected to control tall, mature brush. A good strategy is sufficient goats to eat all leaves from all brush species two or three times per year. Spanish goats are probably a better choice than Angoras for rough mountainous areas.

PB83-152629/GAA PC **A08**/MF **A01**
Enviro Control, Inc., Rockville, MD.
Assessment of Engineering Control Monitoring Equipment - Volume I.
Final rept.
Jun 81, 157p NIOSH-210-79-0011-VOL-1
Contract PHS-NIOSH-210-79-0011
See also PB83-152637.

Keywords: *Safety, *Environmental surveys, *Air pollution, Phosgene, Exposure, Toxicity, Inspection, Hazardous materials, Cotton fibers, Vinyl-chloride, Carbon monoxide, Lead(Metal), Performance evaluation, Assessments, *Toxic substances, *Occupational safety and health, CAS 75-44-5, CAS 75-01-4, CAS 630-08-0, CAS 7439-92-1.

Monitoring systems for determining the performance of engineering controls designed to reduce or eliminate worker exposure to hazardous chemical agents are evaluated. The availability and suitability of commercially available monitors are assessed for information supplied by manufacturers. Monitoring techniques were described for single and multiple chemical agents and for nonchemical agent engineering control and ventilation systems. Six survey reports are presented on operational monitoring systems for phosgene (75445), vinyl-chloride (75014), cotton dust, carbon-monoxide (630080), and lead (7439921). Deficiencies in monitoring technology are identified, and recommendations for research and development are made. A users' guide is given for the identification and selection of monitoring equipment options. The authors conclude that the study results are useful as a reference by industry and government personnel concerned with engineering control monitoring equipment.

PB83-152637/GAA PC **A18**/MF **A01**
Enviro Control, Inc., Rockville, MD.
Assessment of Engineering Control Monitoring Equipment - Volume II.
Final rept.
Jun 81, 403p NIOSH-210-79-0011-VOL-2
Contract PHS-NIOSH-210-79-0011
See also PB83-152629.

Keywords: *Safety, *Environmental surveys, *Air pollution, Exposure, Toxicity, Inspection, Hazardous materials, Design criteria, Performance evaluation, Assessments, *Toxic substances, *Occupational safety and health.

A users' guide to the assessment of engineering control monitoring equipment provides data sheets on commercially available instrument systems suitable for online monitoring of engineering controls and work practices. The information includes guidelines for selecting online monitoring instruments, matrices for identifying monitoring options, terminology used in defining performance and procurement specifications, and information summaries on several hundred monitoring instruments.

PB83-153064/GAA PC **A04**/MF **A01**
Central Tobacco Research Inst., Rajahmundry (India).
Important Pests of Tobacco - Their Identity and Control.
Leaflet no. 2 (Rev.).
1979, 66p

Keywords: *Pest control, *Plants(Botany), *Pesticides, Worms, Beetles, Diptera, Plant diseases, Fungus diseases, Viruses, India, Developing country application.

This leaflet gives details about the pests attacking tobacco such as caterpillars and cutworms, stem borer, white flies, grass-hoppers, ground beetles, aphids, capsule borer and cigarette beetle. The natural history of the pest, the nature of injury and its control are discussed. Some of the common diseases which attack flue-cured tobacco are: damping off, black shank, anthracnose, frog-eye spot, brown spot, powdery mildew, tobacco mosaic, leaf curl, orobanche and root knot. Causes, symptoms and control measures for each disease are listed.

PB83-153114/GAA PC **A05**/MF **A01**
Central Tobacco Research Inst., Rajahmundry (India).
Package of Practices for F.C.V. (Flue-Cured Virginia) Tobacco in Andhra Pradesh (Revised Edition).
1978, 89p

Keywords: *Plants(Botany), *India, *Fertilizers, Planting, Cultivation, Soil properties, Plant diseases, Pest control, Curing, Standards, Developing country application.

The growth process of Flue cured Virginia tobacco from the nursery seedling right up to its curing and grading is outlined. The selection of nursery sites, care of the seedlings, the type of soil required, the prevailing cultural and manurial practices relevant to the tobacco growing, its curing and grading are dealt with in detail.

PB83-153411/GAA PC **A06**/MF **A01**
Office of the United States Trade Representative, Washington, DC.
Guide to the U.S. Generalized System of Preferences (GSP).
Dec 82, 105p

Keywords: *Taxes, Tariffs, Government policies, *International trade.

The United States now offers duty-free entry to developing countries on approximately 2,850 product categories. Under its Generalized System of Preferences (GSP), a wide range of eligible articles can enter duty-free into the United States when imported from any of over 140 designated beneficiary developing countries and non-independent countries and territories. The program began January 1, 1976, and will expire January 4, 1985. This booklet is a practical guide to the U.S. system: how to find out what products are eligible, what countries have been designated, what must be done by producers, exporters and U.S. importers to qualify shipments, and where to obtain further information.

PB83-153916/GAA PC **A08**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Pesticide Programs.
Pesticide Assessment Guidelines, Subdivision F, Hazard Evaluation: Human and Domestic Animals.
Nov 82, 163p EPA-540/9-82-025

Keywords: *Pesticides, Humans, Animals, Assessments, Toxicity, Bioaccumulation.

As a guideline for the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), Subdivision F supports the data requirements of 40 CFR Part 158. Subdivision F describes protocols for evaluating the toxicity of pesticides to nonhuman organisms and for relating the results of these studies to human safety evaluations. Comments from environmental groups, academia, and industrial representatives were incorporated into the current draft. Subdivision F constitutes one volume of a twelve-part FIFRA guidelines series published by the National Technical Information Service.

PB83-154146/GAA PC **A04**/MF **A01**
Federation of American Societies for Experimental Biology, Bethesda, MD. Life Sciences Research Office.
Insights on Food Safety Evaluation.
Final rept.
Dec 82, 63p FDA/BF-83/15
Contract FDA-223-81-2394

Keywords: *Food, Toxicology, Bioassay, *Safety, Evaluation, Generally recognized as safe food ingredients.

This report was developed by a group of qualified scientists under the direction of FASEB designated the Select Committee on GRAS Substances (SCOGS). It provides the SCOGS Committees views on food safety evaluations based on 10 years of experience in the food safety evaluation process.

PB83-154195/GAA PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Agricultural Finance: Outlook and Situation,
George R. Amols, Frances A. Burke, Ron L. Durst, Linda R. Farmer, and Stephen C. Gabriel. 17 Dec 82, 30p AFO-23

Keywords: *Agricultural economics, *Financial management, Financing, Credit, Liabilities, Loans.

Financial conditions in the farm sector continued to deteriorate in 1982. Major contributing factors were sluggish foreign and domestic economic conditions, large world crop supplies, high interest rates, and the cumulative impact of 3 years of low farm income. The number of farmers in financial distress increased, although it remains very low.

PB83-154351/GAA PC **A03**/MF **A01**
Michigan State Univ., East Lansing. Inst. of Water Research.
Utilization of Wastewater for Intensive Fish Culture.
Rept. for 1 Jan 75-30 Sep 78,
Howard E. Johnson, and Daniel J. Duffield. Sep 80, 41p W83-01788, , OWRT-A-082-MICH(2)
Contract DI-14-34-0001-5022

Keywords: *Fishes, *Waste water reuse, *Aquaculture, Production, Lagoons(Ponds), Density(Mass/volume), Water quality, pH, Oxygen, Dissolved gases, Ammonia, Toxicity, Acceptability, Michigan, Mortality.

Channel catfish were reared in 0.8 cu m cages in a southern Michigan farm pond and a pond which received secondary treated domestic wastewater. Cages were stocked in May with 117 mm fingerlings at densities of 50, 100 and 150 fish per cubic meter. The fish production in the farm pond was approximately 44.8 kg/cu m compared with 12.5 kg/cu m in the wastewater pond. The lower production in the wastewater pond was probably due to adverse water quality conditions including high pH, low dissolved oxygen and high concentrations of unionized ammonia. The results indicate that cage culture is not suitable in highly enriched wastewater ponds with extensive plant growth but successful cage culture may be practiced in southern Michigan farm ponds.

PB83-154492/GAA PC **A25**/MF **A01**
Bureau of Industrial Economics, Washington, DC.
U.S. Industrial Outlook, 1983 for 250 Industries with Projections for 1987.
Jan 83, 578p*
See also PB83-154484.

Keywords: *Economic development, Economic factors, Sales, Market value, Manufacturing, Services, International trade, *Industrial development.

This book is a collection of industry reviews and forecasts for 250 U.S. industries. Economic trends from 1972 and projections to 1987 are presented for each industry studied. The value of shipments for both domestic and international trade are discussed.

PB83-155499/GAA PC **A09**/MF **A01**
Indian Council of Agricultural Research, New Delhi.
Jute Agricultural Research Institute Annual Report, 1979.
Aug 82, 200p

Keywords: *Plants(Botany), *Agriculture, *India, Agricultural engineering, Meteorology, Soil chemistry, Entomology, Microbiology, Plant pathology, Agricultural economics, Developing country application.

The Institute's work in the following fields is detailed: Plant breeding and genetics; soil chemistry; microbiology and STCR; agronomy, plant nutrition, agricultural engineering, mycology and pathology; entomology; agricultural statistics, agricultural meteorology and agricultural extension. Reports on the operational research projects and 'lab to land' project, the activities of the Ramie research station, Sisal research station, and Sunhemp research station are included.

PB83-155549/GAA PC **A18**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.).
Implementation of a Modular, Flexible Production System with Automatic Information Processing.
Jan 83, 407p* KFK-PDV-195
Trans. of mono. Realisierung eines Modularen, Flexiblen Fertigungssystems mit Automatischer Informationsverarbeitung, n.p., 500p Aug 80.

Keywords: *Computers, *Information systems, Manufacturing, Data processing, Automatic control, Machine tools, Machining, Systems engineering, Modular construction, Translations.

A flexible manufacturing cell was developed as a basic module for a stepwise installation into flexible manufacturing systems. For a range of rotational workpieces, which were selected from an actual industrial part spectrum the specific handling, machining operations and measuring tasks were investigated. The flexible manufacturing cell includes all the components necessary to machine automatically a family of rotational workpieces on a single machine-tool. In addition to this objective the machine-tool must operate for at least one shift without human control. To accomplish this task, the technological and control functions of a CNC-machine-tool are enlarged by means of automatic storage of working-stock, material and information and for the automatic handling of workpieces, clamping- and measuring devices.

PB83-156760/GAA PC **A06**/MF **A01**
Alexandria Univ. (Egypt). Higher Inst. of Public Health.
Multiple Water Reuse in Poultry Processing: Case Study in Egypt.
Final rept. 1 Apr 76-31 Mar 80,
Ahmed Hamza. Jan 83, 109p EPA-600/2-83-005

Keywords: *Food processing, *Waste water reuse, *Poultry, *Egypt, Chlorination, Cooling water, Filtration, Diatomaceous earth, Bacteria, Greases, Water conservation, Flushing, Requirements, Potable water, Fresh water, Tables(Data), Shelf life.

An industrial-scale multiple water reuse system was under investigation for a period of four years at a modern poultry processing plant in Alexandria, Egypt. The system involved: chlorination of cooling water from the compressor; reuse of this water in the chiller; successive transfer of an equivalent amount of water from the chiller to the prechiller, from the prechiller to the wash tank, and finally, from the wash tank to the scalder. Process waters in the prechiller and wash tank were alternately purified by diatomaceous earth filtration. Long-term studies at the plant indicated successful utilization of a multiple reuse system with chlorinated water (20 mg/l input) and a water makeup rate of 20 m3/day.

PB83-158675/GAA PC **A05**/MF **A01**
Arizona Univ., Tucson. Office of Arid Lands Studies.
Jojoba Wild Stands: Natural History and Use Impacts.
Final rept.,
Jean L. Mills, and Kennith E. Foster. Feb 82, 80p
Sponsored in part by Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.

Keywords: *Drought, History, Sonoran Desert, Seeds, Waxes, *Oilseed crops, Plant ecology, Distribution(Property), Reproduction(Biology), Harvesting, Environmental impacts, Cattle, *Jojoba.

This extensive literature review identifies sources of information about the natural history and use impacts of jojoba, a drought-resistant evergreen shrub of the Sonoran Desert. Between 40 and 60 percent of the large jojoba seed is a liquid wax with many commercial uses; it is a potential substitute for whale oil.

PB83-156790/GAA PC **A06**/MF **A01**
Institution of Engineers (India), Nagpur.
All India Seminar: Low Cost and Package Water Treatment Plants for Drinking Water in Rural Areas, Held at Nagpur on January 8-9, 1977.
Jan 77, 102p
Sponsored in part by National Environmental Engineering Research Inst., Nagpur (India)., and India Water Works Association, Nagpur.

Keywords: *Water treatment, *Rural areas, Clarification, Cost effectiveness, Potable water, Iron, Ground water, Hydrology, Water supply, Sand filters, Pumps, India, Developing country application.

The aim of the seminar was to discuss all the aspects of rural water supply with special reference to the point of economy and development of package water treatment plants which are low cost and appropriate to rural conditions.

PB83-158923/GAA PC **A19**/MF **A01**
National Research Council, Washington, DC.
Pharmaceuticals for Developing Countries - Conference Proceedings.
Final rept.
1979, 443p ISBN-0-309-02891-4
Contract DHEW-282-78-EJM
Library of Congress catalog card no. LCCCN-79-89015.

Keywords: *Drugs, *Industrial development, Diagnostic agents, Pharmaceutical industry, Effectiveness, Safety, Therapy, Research, Prophylaxis, Accessibility, Foreign countries, Biomedical research.

The conference reported here was proposed to explore four sets of inter-related issues: (1) the principal health problems of the developing world and the effectiveness, safety, and utilization of those preventive, prophylactic, and therapeutic agents now available; (2) the factors responsible for the paucity of research effort of the disease problems of developing countries by the biomedical research establishments of the American pharmaceutical industry and universities; (3) relevant scientific opportunities and (4) policy initiatives required to strengthen incentives and overcome disincentives for industry and the academic community to do more to help solve these problems.

PB83-159244/GAA PC **A11**/MF **A01**
Instituto Nacional de Investigaciones Forestales, Mexico City.
Alternativas para el USO del Suelo en Areas Forestales del Tropico Humedo. Tomo 1-4 (Alternatives for using the Land in Forest Areas of the Humid Tropic. Volumes 1-4),
Helmut Janka, and Hansjoerg Steinlin. Sep 81, 242p SP-26, SP-29
Text in Spanish. Also includes rept. nos. SP-27 and SP-28. Also pub. in ISSN-0185-2566.

Keywords: *Central America, *Tropical regions, *Forestry, *Economic development, Conservation, Exploitation, Guatemala, Humans, Settling, Anthropology, Plants(Botany), Steroids, Mexico, Developing country application, Barbasco.

In this publication are presented some results of the research done by members of the 'Agreement on planning the exploitation and utilization of tropical forest areas', signed on August, 1978 by the governments of West Germany and Mexico. Vol. I includes 2 studies which define the areas where to do the research, contribution to the economic situation, and living conditions in the rural tropical and subtropical areas. Vol. II: Preservation of the 'Montes Azules' biosphere (near the Guatemalan border); human settlements and fauna of the Lacandona Forest, Economic anthropology of the Mayan communities of the Lacandona Forest, Chiapas; Vol. III: Prehispanic strata in the Lacandona Forest and its importance in systems of agricultural production; Intensive cultivation, socio-economic implications; and Vol. IV: The Mexican 'barbasco' (dioscorea composita, a plant), its commercial growth.

PB83-159251/GAA PC **A11**/MF **A01**
Instituto Nacional de Investigaciones Forestales, Mexico City.
Primera Reunion Nacional sobre Jojoba (First National Conference on Jojoba),
Avelino B. Villa Salas, Oscar Cedeno Sanchez,
Carlos E. Gonzales Vincente, and Raul Villaraeal
Canton. Nov 81, 244p SP-30
Text in Spanish. Also pub. in ISSN-0185-2566.

Keywords: *Deserts, *Arid land, *Mexico, Research projects, Cultivation, Pest control, Field tests, Soil properties, Extraction, Reproduction(Biology), Germination, Industries, Climate, Byproducts, Elastomers, Developing country application, *Jojoba, Simonsia chinensis, Commercialization, Baja California(Mexico).

This document contains 42 reports on the Jojoba presented at La Paz, Baja California Sur, from 25 to 28. They are on five different themes. Theme 1 is the evaluation of the research studies conducted in Mexico on the Jojoba. Theme 2 is the cultivation and exploitation of the jojoba. Theme 3 is processing of the plant. Theme 4 is commercialization of the Jojoba; and theme 5 is domestication and cultivation of the Jojoba.

PB83-159269/GAA PC **A04**/MF **A01**
Instituto Nacional de Investigaciones Forestales, Mexico City.
Primera Reunion sobre Plagas y Enfermedades Forestales (First Conference on Forest Pests and Diseases),
Avelino B. Villa Salas, Justina Perusquia Ortiz,
Francisco Martinez Gonzales, Carlos E. Gonzales
Vincente, and Rafael Antonio Bejar Martin. Nov 81,
56p SP-32
Also pub. in ISSN-0185-2566.

Keywords: *Pest control, *Forestry, *Plant diseases, Forest trees, Distribution(Property), Bark, Defoliation, Pine trees, Microorganisms, Mexico, Developing country application.

Since 1960 the National Institute of Forest Research of Mexico has investigated the habits of insects that cause forest diseases, their distribution, and means to control them. The pests have been attacked by curative rather than preventive measures, and reports of the appearance of pests are growing, confirming the destruction of important areas of trees. This document assesses the situation and proposes some short and medium term solutions.

PB83-159277/GAA PC **A05**/MF **A01**
Instituto Nacional de Investigaciones Forestales, Mexico City.
Nopal (Cactus opuntia),
Jose Miguel Medina Cota, and Alfredo Vazquez
Aguilar. Dec 81, 89p SP-34
Text in Spanish. Also pub. in ISSN-0185-2566.Color illustrations reproduced in black and white.

Keywords: *Plants(Botany), *Deserts, Morphology, Chemical properties, Taxonomy, Mexico, Plant ecology, Plant reproduction, Pest control, Forage crops, Feeding stuffs, Marketing, Developing country application, Commercialization.

The purpose of this document is to summarize the information acquired on the nopal from the past and to report the results of the research and experiences with nopal (Opuntia) in order to know better this resource and to improve the conditions for cultivation of this cactus. Sixteen chapters on different aspects related to this plant, such as morphology and characteristics of the plant, chemical components, taxonomy, some common species of nopal in Mexico, ecology, propagation, pests, application of the nopal as forage and foodstuffs, marketing and commercialization of the prickly pear, financial analysis of the prickly pear, and the seed or cochineal.

PB83-159517/GAA PC **A02**/MF **A01**
Ruhrchemie A.G., Oberhausen (Germany, F.R.).
Thermal Processing of Spent Catalysts,
D. Ernst, and S. Speth. Feb 83, 24p BMFT-FB-T-80-189
Trans. of mono. Thermische Aufarbeitung von Altkatalysatoren, n.p., 24p Dec 80. See also N82-12205.

Keywords: *Metals, Purification, *Chemical industry, Petrochemical industry, Residues, Fluidized bed processing, Laboratory equipment, Translations, *Waste recycling, Solid wastes.

The well-known recovery of metals or their compounds from spent catalysts is complicated or becomes uneconomical when coke or high-molecular compounds are present. By means of a special pretreatment of the spent catalysts following the thermal processing in the fluidized-bed reactor, it is possible to obtain a starting material free from organic impurities, which is suited for the recovery of the valuable components of the catalysts in a known manner. In the course of further development it was possible to complete successfully work on the feeding of the fluidized-bed reactor with used catalysts from widely varying sources. The waste-gas purification and fine-dust separation comply with emission regulations The unit is to be regarded as a demonstration plant, especially if the waste-heat utilization can be integrated to improve the economic performance.

PB83-159921/GAA PC **A05**/MF **A01**
Centre Technique des Industries Mecaniques, Saint-Etienne (France).
Exploratory Study of Flexible Workshops,
M. Jubin. Jan 83, 100p CETIM-1-4N-12-9
Trans. of mono. Etude Exploratoire Ateliers Flexibles, n.p., 112p Jul 81. See also N82-18421.

Keywords: *Industrial plants, Automation, Flexibility, *Plant layout, Manufacturing, Production engineering, Translations.

The flexibility of the industrial workshop in performing a variety of fabrication jobs is considered. The relatively large amount of production time which is lost due to too much (production line) or too little (single jobber) machine specificity is cited. A best possible compromise between productivity and job flexibility is sought. An automated universal workshop is proposed. The individual fabrication units are described, taking machine tool manufacture as an example. The control system and materials handling system are depicted. Generalization to most mechanical construction tasks is regarded as feasible.

PB83-161950/GAA PC **A03**/MF **A01**
Punjab Agricultural Univ., Ludhiana (India). Coll. of Veterinary Science.
Immunisation against Bovine Tropical Theileriosis.
Final rept. 1 Oct 78-30 Sep 80.
Dharam Kaur, Harsharanjit Singh, and S. N. Samantaray. Sep 80, 27p

Keywords: *Animal diseases, *Vaccines, Validity, Infectious diseases, Cultures(Biology), Developing country application, Theleria annulata.

The objective of the scheme was to intensify work on producing vaccines against theleria annulata. This objective has been fulfilled as the extended work under the present scheme has further established validity of 3 methods of immunisation, Quantum of infection, Infection-treatment and Tissue-culture vaccine. All these 3 methods solidly immunized animals, as these are fully protected against lethal challenge infection. The latter two methods can be adopted in practice.

PB83-162107/GAA PC **A03**/MF **A01**
Development and Consulting Services, Butwal (Nepal).
Operation and Maintenance of Gobar Gas Plants. Second Edition,
John H. Finlay. 1980, 50p

Keywords: *Industrial plants, *Waste recycling, *Manures, Design criteria, Performance evaluation, Solid waste disposal, Leakage, Industrial engineering, Agricultural wastes, *Biogas, Developing country application.

The first report gives detailed instructions on running a biogas plant, covering preparation of the dung slurry; filling the pit and adding bacteria; fitting the gas holder and the first gas; adjustment and care of appliances; gas pressure; daily, weekly, monthly, and yearly routines; cold month procedures; use and disposal of spent slurry; overcoming problems; safety; and how to find possible gas leaks. Working drawings necessary to start one's own plant are included. The report on the Tapei symposium adds useful information on Red Mud Plastic as a construction material and comments on integrated farming. The Taipei paper is entitled, '500 Cattle Dung (Gobar) Gas Plants Built in Nepal in 5 Years from Design to the Field and Back again.' It gives a comprehensive resume of the very successful Nepali biogas project. The ESCAP paper also reviews the Nepali project, but only 95 plants run for two years. This review is very comprehensive however.

PB83-162495/GAA PC **A05**/MF **A01**
Intermediate Technology Development Group, London (England).
Construccion de Tanques de Agua de Ferrocemento (Ferrocement Water Tanks and their Construction),
S. B. Watt. c1978, 95p ISBN-0-903031-51-5
See also PB-297 375. Text in Spanish.

Keywords: *Reinforced concrete, *Water supply, *Containers, Manuals, Construction, Steel wire, Livestock, Irrigation, Design, Standards, Industries, Construction materials, Reinforcing materials, Developing country application.

This publication describes in detail, methods of constructing water storage tanks from wire-reinforced cement-mortar. These tanks are widely used in many parts of the world to collect and store water for domestic, stock, irrigation, and also for industrial purposes. Subject areas include planning and designing the tank, standard methods of construction, and alternative designs. (Copyright (c) Intermediate Technology Publications Ltd., 1978.)

PB83-162677/GAA PC **A10**/MF **A01**
Institution of Engineers (India), Nagpur.
All India Seminar on Economic Design of Medium and Minor Cross Drainage Works. Held on July 14-15, 1979.
Jul 79, 223p

Keywords: *Hydrology, Foundations, Design, Construction, Hydraulic models, Piers, Retaining walls, Protection, Aqueducts, Bridges, Head loss, Erosion, Canals, Catch basins, Cost analysis, Runoff, Crossings, India, Developing country application.

This seminar was organized to study in detail the existing practice of design and construction of cross-drainage works and evolve methods to optimize the designs with integrated approach. The seminar covered various aspects of hydraulic considerations and structural design, combining the total effect of these on the economy. The topics covered are: Hydrology and Planning; Choice of Structure Including Prefabricated Members; Foundation; Piers and Bearings; Superstructure; Retaining, Training and Protection Works.

PB83-162834/GAA PC **A03**/MF **A01**
Interagency Toxic Substances Data Committee, Washington, DC.
First Report of the Interagency Toxic Substances Data Committee.
Nov 80, 42p
Sponsored in part by Council on Environmental Quality, Washington, DC., and Environmental Protection Agency, Washington, DC.

Keywords: *Information systems, Toxicology, Risks, *Toxic substances, Occupational safety and health.

This is the first report of the Interagency Toxic Substances Data Committee (ITSDC) on its efforts to coordinate classification, storage, and retrieval of chemical information. Since its inception in 1978, the ITSDC has focused its efforts on the construction of a Chemical Substances Information Network (CSIN). The Chemical Substances Information Network is designed to facilitate efficient and widespread use of many independent sources of chemical information. By providing analytic capabilities and interconnections between various kinds of data, it streamlines collection and integration of information from diverse sources, reducing the time and paperwork required to reach informed decisions about chemical hazards and benefits. CSIN will ultimately contribute to better decision-making by all sectors of society as they grapple with the known and unknown risks of chemicals.

PB83-162982/GAA PC **A03**/MF **A01**
Maschinenfabrik Augsburg-Nuernberg A.G., Munich (Germany, F.R.).
Economic Solar Heating System with Cost-Efficient Flat-Plate Collectors.
Final rept. Sep 79-Oct 80,
Waldburg Eder-Milchgieber, and Roland Burkart. Feb 83, 28p BMFT-FB-T-80-113
Trans. of mono. Entwicklung Wirtschaftlicher Solarheizsysteme mit Kostenguenstigen Kollektoren, n.p., 24 p Oct 80. See also N81-24592.

Keywords: Hot water heating, Automatic control equipment, Temperature control, Swimming pools, Translations, *Solar water heating, Solar water heaters, Flat plate collectors.

A cost-efficient flat-plate solar collector for providing hot water and/or heating swimming pools is described. Efficiency curves were determined experimentally and service life investigated. The weather-proof construction affords versatility, ease of, and hence low-cost installation. Various types of mounting are given, especially for pitched roofs. A range of automatic control systems incorporating the solar collector are presented.

PB83-163279/GAA PC **A02**/MF **A01**
National Building Research Inst., Pretoria (South Africa).
Use of Organic Materials in the Maintenance of Buildings,
R. E. Cromarty. 1980, 9p R/BOU-861

Keywords: *Buildings, *Maintenance, Plastics, Cost analysis.

The conclusion is that organic materials can do much to reduce maintenance costs on buildings, when correctly applied, but when incorrectly used they can deteriorate rapidly and become a major source of building maintenance.

PB83-163311/GAA PC **A05**/MF **A01**
Council for Scientific and Industrial Research, Pretoria (South Africa). Technical Services Dept.
Plastics in the 80's.
Mar 82, 82p TSD BOOK-0001/82, ISBN-0-7988-2357-7

Keywords: *Plastics, *Construction, *Building materials, Construction materials, Reinforced plastics, Automotive industry, Electron beams, Forecasting, Design criteria.

Contents:
  An overview;
  High-duty, fibre-reinforced plastics;
  Plastics in the automotive industry;
  Electron-beam processing of plastics;
  The future of plastics in the construction industry;
  The use of plastics for domestic products;
  Designing in plastics, with particular reference to the role of the mould designer.

PB83-163550/GAA PC **A08**/MF **A01**
Johns Hopkins Univ., Baltimore, MD. School of Medicine.
Research Study to Improve Teenage Contraception Practices.
Final rept.,
Theodore M. King, and Flora N. Roebuck. Oct 81, 172p MCH/CCS-82/06
Grant PHS-MC-R-240422

Keywords: *Contraceptives, *Education, *Birth control, Attitudes, Behavior.

This study investigated the effectiveness of short-term educational intervention in changing adolescent contraceptive practices and sexual hygiene in order to reduce repeat pregnancy rates and the frequency of sexually transmitted disease among the study samples.

PB83-163824/GAA PC **A11**/MF **A01**
California Univ., Los Angeles.
Child Amputee Prosthetics Project - Research.
Final rept.,
Yoshi Setoguchi, Carl Sumida, and Julie Shaperman. Mar 82, 248p MCH/CCS-82/04
Grant PHS-MCR-060004

Keywords: *Children, *Prosthetics, *Health, Amputation, Artificial limbs, Design.

The main objective of the study was to design and develop new prosthetic components to meet the needs of limb deficient and amputee children. Most of the components were to be parts of a total system. During a 13 1/2 year period (1967-1981) seventeen devices were designed and developed - three mobility devices, one assistive device, one lower extremity device and twelve upper extremity devices and using a developmental methodology. The devices took into account factors in child development, functional needs, materials and methods of production. Clinical trial was conducted to evaluate whether components met their design goals; these evaluations were conducted at the Child Amputee Prosthetics Project.

PB83-165068/GAA PC **A03**/MF **A01**
National Bureau of Standards, Boulder, CO. National Engineering Lab.
Membrane Separations in Chemical Processing,
Thomas M. Flynn, and J. Douglas Way. Dec 82, 28p
NBSIR-82-1675
See also PB82-264276.

Keywords: *Energy conservation, Separations, *Chemical industry, Technology, Operating costs.

Rapidly rising energy and operating costs have underscored the need for novel energy efficient separations processes, such as membrane processes, which avoid the energy consuming phase change step of many conventional separations (e.g., distillation, absorption, stripping). It is well known that membrane separation is the most energy efficient separation technique thermodynamically possible, since it does not rely upon vaporization and condensation to effect fractionation. Recent developments in solid polymer, hollow fiber and liquid membranes give excellent promise for industrial application. Hence, because of recent technological developments of these new membranes, and because of its great energy savings potential, research is being conducted on the fundamentals determining separation rates, separation factors, and selectivity of new types of solid and liquid membranes with potential application to the chemical process industry.

PB83-165688/GAA PC **A04**/MF **A01**
Council for Scientific and Industrial Research, Pretoria (South Africa). Technical Services Dept.
Mini-Seminar on Materials Handling.
Jun 82, 75p TSD BOOK-0003/82, ISBN-0-7988-2359-3

Keywords: *Materials handling, *South Africa, Storage, Warehouses, Trends, Automation, Equipment, Financing, Robots.

The seminar concerned trends in warehousing, equipment purchase, use of industrial robots, and economics of automated systems.

PB83-165936/GAA PC **A02**/MF **A01**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Energy Storage for Wind-Generator Application,
F. M. Russell. c1982, 10p RL-81-081

Keywords: *Energy, *Wind energy, Energy storage, Deformation, Elastic properties, Inflatable structures, Subsurface structures, Underground storage, Wind power generation, Developing country application.

A low-cost method was developed for storing energy and stiffening power supplied by wind generators. It involved inflatable, fabric-reinforced elastic liners buried underground and containing a fluid, probably water, at an intermediate pressure. The ground would be subject to elastic deformation and the method could be applicable to unstable ground such as deep sand, heterogeneous sedimentary or other unconsolidated deposits in remote locations or hostile environments. While the density of energy storage was considered low, compared with pumped-hydro systems, the technology could be attractive for developing countries.

PB83-166025/GAA PC **A04**/MF **A01**
Instituto Dominicano de Tecnologia Industrial, Santo Domingo.
Guia Para el Uso del Sistema Internacional de Unidades: Definiciones y Tablas de Equivalencias (Guide for the Use of the International System of Standards: Definitions and Tables of Equivalents).
1977, 59p
Text in Spanish.

Keywords: *Standards, Tables(Data), Developing country application.

The International System of Standards prevents the confusion that would be caused by the use of different standards of measurement. This system has proven to be more rational than others in all scientific and technical fields, and today it is the most used in every field. This guide points out recommendations and practical rules for the correct utilization of the International System of Standards, and provides factors for the conversion of other systems to the international one through equivalency tables.

PB83-166439/GAA PC **A17**/MF **A01**
Indian Inst. of Tech., Bombay.
Rolling of Metals,
V. A. Javoronkov, and R. C. Chaturvedi. c1981, 400p
Prepared in cooperation with Moscow Higher Technical Inst. (USSR).

Keywords: *Metals, Rolling mills, Design, Technology, Blooms(Metals), Billets, Metal slabs, Theory, Metal plates, Metal sheets, Tubes.

The book is largely based on the lectures delivered by the authors at the postgraduate programs at IIT Bombay and other institutions, as well as at the short term courses for persons in the industry. This book is devoted to only one process i.e. Rolling, and its coverage of all the three main facets of the science of rolling, viz. technology, theory, and the design of equipment. A good use of principles, of rolling, of calculation of forces and of design of rolling mill elements outlined in this volume can definitely result in a better and more efficient utilization of the existing facilities in the steel plants. The chapters in this book are: Basic Problems in Technology of Rolling; Principles of Roll Pass Design; Rolling of Blooms, Slabs and Billets; Rolling of Finished Sections; Rolling of Strip Sheet and Plate; Production of Tubes and Machine Parts; Fundamentals of Theory of Rolling; Calculation of the Forces and Torques Required for Rolling; Design of Rolls and Bearings, Housing and Adjustment Mechanisms; Transmission Mechanism; and Electrical Drive and Automation for Rolling Mills.

PB83-166629/GAA PC **A04**/MF **A01**
Commission of the European Communities, Luxembourg.
Manufacturing Method for Photo-Voltaic Materials by Chemical Spray Pulverization.
M. Savelli, J. Lahaye, and J. Vedel. Feb 83, 60p
EUR-7015-FR
Trans. of mono. Methode de Fabrication de Materiaux Photo-Voltaiques par Pulverisation Chimique Spray, n.p., 64p 1982.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Keywords: *Photovoltaic Power System, Supports, Adhesion, Atomizing, Translations.

Acetonitrile has been shown to be a suitable carrier solvent for the preparation of thin layers of cuprous sulphide by chemical atomization. A reactive spraying apparatus for monodispersed mist has been developed. It is claimed to be indispensable for establishing a firm relation between the characteristics of the mist and those of the films obtained. The formation of thin layers of cadmium sulphide and stannic oxide on various supports has been studied and the quality of the layers, their adhesion to the support, and the influence of the nature and temperature of the support on the reactions have been investigated. Three laboratories have participated in the evaluation of the physical characteristics of the thin layers.

PB83-166694/GAA PC **A03**/MF **A01**
Development and Consulting Services, Butwal (Nepal).
Economics of Gobar Gas.
Alan Pang, Prakash Chandra Shrestha, and David Fulford. 1980, 49p
Portions of this document are not fully legible.

Keywords: Farms, Economic analysis, Feasibility, Sites, Inspection, Surveys, *Fuels, Inspection, *Biogas, Manure, Solid wastes, Developing county application.

This series of reports follows a sequence necessary to start and run a biogas project. The first provides and introduction to biogas, its costs, and its yields. Its use will conserve forests, create clean, healthy fuel and fertilizer, and save Nepal foreign exchange. The feasibility study considered water and dung supply, degree of cooperation among the affected villagers, the need for the plant, and intangibles such as erosion control. The initial survey investigates the community social situation, needs, and cooperation. The Gobar Gas company had had personnel problems which decreased service, but the problems were being worked out. The project has been highly successful. The 11 Chinese plants worked well with no leaks from the cement but the gas valves leaked. The scum breaker also caused problems. The high quality plaster work required is the greatest hindrance.

PB83-166702/GAA PC **A04**/MF **A01**
Solar Energy Research Inst., Golden, CO.
Biogas, Farmers, and Development in Nepal; Biogas in Nepal: A State of the Art,
J. Finlay, Dan E. Jantzen, A. Schlorholtz, N. Peters, and D. J. Fulford. 1981, 74p SERI/TP-624-925
Contract DOE-EG-77-C-01-4042
Prepared in cooperation with Development and Consulting Services, Butwal (Nepal). Portions of this document are not fully legible.

Keywords: *Waste recycyling, Biomass, *Fuels, Methane, *Fertilizers, Design criteria, Performance evaluation, Surveys, Industrial plants, Farms, *Biogas, Solid wastes, State of the art, Developing county application, Manure, Energy sources.

The first of the two reports making up this publication was prepared for SERI; the second is solely by Development and Consulting Services of the United Mission to Nepal. The first report describes the Nepali project in which over 500 biogas units have been built using Indian, Chinese, and new tunnel digesters. A survey indicated farmers are satisfied with their digesters, but a number of problem areas remain. The digesters are competitive with commercial firewood and cheaper than other sources of energy used. A company to build and service digesters has been set up, which provides a 20 year guarantee and annual visits by technicians. The earlier report investigates the state of the art of biogas up to 1978. Its use was meant to reduce deforestation, as well as provide energy and fertilizer. The Indian design was the starting point, but presented problems because of Nepal's higher altitude and colder climate. By 1978, 350 plants had been built. Because poor farmers couldn't afford their own plants, large plants for whole communities was attempted. Sociological studies should be able to overcome the sociological problems caused by such new schemes.

PB83-166785/GAA PC **A13**/MF **A01**
National Inst. of Nutrition, Hyderabad (India).
National Institute of Nutrition Annual Report, January 1-December 31, 1981.
1982, 300p

Keywords: *Nutrition, Nutritive value, Humans, Nutritional requirements, Nutritional deficiencies, Research, Drugs, Toxicology, Food poisoning, Food adulteration, Vitamins, Protein, Metabolism, Developing country application.

This report covers a wide range of research on varied aspects of nutrition and allied disciplines undertaken by the National Institute of Nutrition, Food and Drug Toxicology Research Centre during 1981. Summaries of the research and the results in the following fields of investigation are given: Nutritive value of foods, vitamins, protein energy, malnutrition and nutrition and brain development, nutrition and metabolic disorders, food toxicology and drug metabolism. Reports on field investigations, extension and training activities are also detailed. The work done by the Laboratory Animals Information Service Center is also included.

PB83-166991/GAA PC **A04**/MF **A01**
Development and Consulting Services, Butwal (Nepal).
Gobar Gas (Biogas) Survey in Nepal - 1979; a Survey of Three Community Biogas Plants in Nepal - 1980; Survey of Present Gobar Gas Work in India; and Night Soil Gas Plant,
Andrew Bulmer, Al Schlorholtz, David J. Fulford, and Nick Peters. 1980, 72p

Keywords: Design criteria, *Fuels, Sources, Performance evaluation, Surveys, Industrial plants, Fertilizers, *Biogas, Manure, Developing country application, Solid wastes.

The first of these documents investigates the success of a project to bring the use of Biogas to Nepal. 50 users and 24 non-users were interviewed. The conclusions were that use of biogas in Nepal is successful, providing clean kitchens, healthier lives, and saving forests. They cause no social problems, but the service company for the plants needs improvement. The second report shows that community plants relying on continued cooperation are fragile enterprises. One of the plants ended up being run by one family, the gas distributed according to the dung input by each family. The gas was not used fully. Technical problems were partly responsible for this. In the second village technical problems and social problems reduced the number of users to 5 families from 26. In the third case the plant fell into disrepair but the social pattern of using a common area for defecation to fill the plant benefitted from having a permanent enclosure built. This scheme charged for use of the gas to help run the plant but the technical and social problems stymied correction. The third report lists the activities of various gobar gas research stations in India. The fourth report gives directions and specifications to build a night soil gas plant, including working drawings.

PB83-167437/GAA PC **E09**/MF **E09**
Liverpool Univ. (England). Marine Transport Centre.
Economics of Short-Sea Freight Ferries.
M. G. Garratt. Nov 80, 190p ISBN-0-905394-089

Keywords: *Ships, *Waterway transportation, Route surveys, Cargo transportation, Handling equipment, Seaports, Marine terminals, Cost analysis.

It is the purpose of this report to attempt to determine the cost structures of the various components of through transport short-sea services, to consider the relationship between traffic volumes and appropriate technology, the way in which shipping lines compete, and how future changes might redirect development. The analysis is based upon a questionnaire survey of operators, interviews with ports and shipping lines, trade press data, and in particular, Lloyds List data on vessel itineraries and Lloyds and other Registers of ships, and the excellent statistics produced by the National Ports Council.

PB83-167684/GAA PC **A04**/MF **A01**
Instituto Nacional de Investigaciones Forestales, Mexico City.
Ciencia Forestal. Volume 5, Numero 23, Enero-Febrero, 1980 (Forest Science. Volume 5, Number 23, January-February, 1980).
Renato Sanchez Ramirez, Roberto Villasenor, Silvia Carrera Garcia, Manuel Enriquez Quintana, and Teresa German Ramirez. Feb 80, 69p
Text in Spanish. See also Volume 5, Number 24, PB80-167692.Color illustrations reproduced in black and white.

Keywords: *Wood, *Mexico, *Forestry, Borers(Biology), Wood, Plant reproduction, Pallets, Oak trees, Lepidoptera, Damage, Developing country application, Plant regeneration, Galls.

This volume includes 4 articles: Pathogenic macromycets and destroyers of wood in the forests of the Tarascan Plateau, Mich; Three tests of grafts in Pinus patula; The industry of wired wooden crates of the State of Durango; Damages associated with the Entomofauna in a population of oaktrees.

PB83-167692/GAA PC **A04**/MF **A01**
Instituto Nacional de Investigaciones Forestales, Mexico City.
Ciencia Forestal. Volume 5, Numero 24, Marzo-Abril, 1980 (Forest Science. Volume 5, Number 24, March-April, 1980).
Ignacio Vazquez Collazo, Rodolfo Lobato, Arturo Carrillo, Fernando Patino Varela, and Ildefonso Talavera Armas. Apr 80, 69p
Text in Spanish. See also Volume 5, Number 23, PB83-167684 and Volume 5, Number 25, PB83-167700.Color illustrations reproduced in black and white.

Keywords: *Tropical regions, *Mexico, *Forestry, Nematodes, Tropical regions, Destruction, Social effect, Pine trees, Seeds, Forest land, Insects, Rodents, Maintenance, Humidity, Forest trees, Developing country application.

This journal contains 5 articles: Nematological exploration in the Experimental Forestry Station 'Barranca de Cupatizio', Uruapan, Mich.; Social stratification and destruction of the Lacandon Jungle in Chiapas (Mexico); Humidity content in seeds of 7 species of Pinus and 1 of Abies during storage and its relation to the germination percentage; Some aspects of forest protection in the experimental station 'El Tormento'; A tool that permits maintenance of humidity in aerial layers.

PB83-167700/GAA PC **A04**/MF **A01**
Instituto Nacional de Investigaciones Forestales, Mexico City.
Ciencia Forestal. Volume 5, Numero 25, Mayo-Junio, 1980 (Forest Science. Volume 5, Number 25, May-June, 1980).
Raul Bertoni Vega, Victor M. Juarez Gutierrez, Jose Maria Barrio Chavira, and Adilfo A. del Rio Mora. Jun 80, 69p
Text in Spanish. See also Volume 5, Number 24, PB83-167692 and Volume 5, Number 26, PB83-167718.Color illustrations reproduced in black and white.

Keywords: *Mexico, *Forestry, *Tropical regions, Forest trees, Plant growth, Lepidoptera, Pine trees, Forest land, Developing country application, Forest plantation, Pinus michoacana.

It contains 3 articles: Behaviour of nine tropical forest species planted in 1971 in the Tropical Experimental Forestry Station 'El Tormento'; Pilot plantation of Gmelina arborea tried with three local resources; Detection of the Genus Petrova (Lepidoptera:Olethreutidae) in natural and artificial repopulations of Pinus michoacana in the Experimental Forest Station.

PB83-167726/GAA PC **A04**/MF **A01**
Instituto Nacional de Investigaciones Forestales, Mexico City.
Ciencia Forestal. Volume 5, Numero 27, Septiembre-Octubre, 1980 (Forest Science. Volume 5, Number 27, September-October, 1980).
Gilberto Chavez Leon, Adolfo A. del Rio Nora, and Renato Sanchez Ramirez. Oct 80, 69p
Text in Spanish. See also Volume 5, Number 26, PB83-167718 and Volume 5, Number 28, PB83-167734.Color illustrations reproduced in black and white.

Keywords: *Tropical regions, *Technology transfer, *Mexico, *Forestry, Animals, Wildlife, Protection, *Insects, Pine trees, Fungi, Food, Poisons, Borers(Biology), Developing country application.

This issue contains three articles: The wild fauna of Quintana Roo - a poorly used resource; Identification of the main pests of cones of Pinus spp. of the experimental forestry station 'Barranca de Cupatitzio', Uruapan, Mich; Edible and poisonous fungi in the forest region of the Tarascan Plateau, Mich.

PB83-167734/GAA PC **A04**/MF **A01**
Instituto Nacional de Investigaciones Forestales, Mexico City.
Ciencia Forestal. Volume 5, Numero 28, Noviembre-Diciembre, 1980 (Forest Science. Volume 5, Number 28, November-December, 1980.
Avelino B. Villa Salas, Francisco Rodriguez Gallegos, Sigrid Diechtl, Victor Job Herrera Sanchez, and Federico Islas Salas. Dec 80, 69p
Text in Spanish. See also Volume 5, Number 27, PB83-167726 and Volume 6, Number 29, PB83-167742.Color illustrations reproduced in black and white.

Keywords: *Technology transfer, *Mexico, *Forestry, Forage crops, Forest trees, Pasture, Borers(Biology), Exploitation, Wood, *Tropical regions, Pine trees, Developing country application, Commercialization.

This journal contains 5 articles: Research on the multiple use of the forest resources of North Sonora; State of the research carried out on Hypsiphylla grandella in the Southeast of Mexico; The Mexican Yam (Dioscoreas genus): Conditions and perspectives for exploitation; Commercialization of rare and common tropical woods in Mexico City; The Southern Huller of the pine tree, D. frontalis and the biological struggle.

PB83-167742/GAA PC **A04**/MF **A01**
Instituto Nacional de Investigaciones Forestales, Mexico City.
Ciencia Forestal. Volume 6, Numero 29, Enero-Febrero, 1981 (Forest Science. Volume 6, Number 29, January-February, 1981).
Javier Chavelas Polito, Rogelio Perez Chavez, Roberto Susano Hernandez, and Roberto Villasenor Angeles. Feb 81, 69p
Text in Spanish. See also Volume 5, Number 28, PB83-167734.Color illustrations reproduced in black and white.

Keywords: *Technology transfer, *Forestry, *Mexico, Forest trees, Forest fires, Pest control, Economic factors, Developing country application, Silviculture.

This journal contains four articles: The Negrito (Simarouba glauca), a native species of multiple use; Forest fires as vectors of forest pests; Forest tree species exploitable as forage; Economics of silviculture development.

PB83-167825/GAA PC **A07**/MF **A01**
UOP, Inc., San Diego, CA. Fluid Systems Div.
Research and Development on Spiral-Wound Thin-Film Composite Membrane Systems.
Final rept. 25 Aug 1981-24 Aug 82,
R. L. Riley, and C. E. Milstead. 17 Sep 82, 133p
W83-02052, , OWRT-C-10062-D(1481)(1)
Contract DI-14-34-0001-1481

Keywords: *Desalination, *Research and development, Performance evaluation, Research, Flux rate, Field tests, Nitrogen organic compounds, Wrightsville Beach Desalination Plant.

Single-stage desalination of seawater by reverse osmosis requires a membrane which approaches theoretical semipermeability and is sufficiently thin to provide transport of water at practical operating pressures and recovery rates. This objective has been achieved by the development of a family of thin-film composite membranes (TFC) based on nitrogen-containing polymers supported on a fabric reinforced porous supporting membrane. Long-term field testing of spiral-would TFC membrane elements at the test facility at Wrightsville Beach, North Carolina, was generally inconclusive since membrane damage due to the frequent presence of chlorine in the feed water precluded obtaining meaningful performance data.

PB83-167874/GAA PC **A03**/MF **A01**
Mississippi State Univ., Mississippi State. Water Resources Research Inst.
Evaluation of Corrosion in Pulp and Paper Mill White Water Reuse Applications.
Technical completion rept. for 1 Oct 79-30 Sep 82,
George R. Lightsey, William B. Hall, and Harold A. Koelling. 1 Oct 82, 43p W83-02057, , OWRT/RU-82/16
Contract DI-14-34-0001-9439
Also pub. as Office of Water Research and Technology, Washington, DC. rept. no. OWRT-C90322-R(1).

Keywords: *Paper industry, Water reclamation, *Corrosion, Circulation, Industrial water.

The purpose of this research was to develop data for predicting the rates of corrosion of common metals at various levels of white water reuse in a pulp and paper mill. The white water at a kraft pulp and paper mill was characterized in terms of physical properties that are known to have potential corrosion hazards. Among the physical properties measured were temperature, conductivity, chloride concentration, hardness, sulfate concentration, pH, barium concentration, and sodium concentration.

PB83-168831/GAA PC **A12**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Priorities in Biotechnology Research for International Development. Proceedings of a Workshop Held in Washington, DC and Berkeley Springs, West Virginia on July 26-30, 1982.
Final rept.
1982, 272p
Grant AID-DAN-5538-G-SS-1023-00

Keywords: *Research and development, *Diseases, Tropical diseases, Research, Animal diseases, Genetics, Tissue culture, Priorities, Energy, Agriculture, Nitrogen fixation, Plant cells, Medical research, State of the art, Monoclonal antibodies.

In response to worldwide interest in the potential of biotechnology, the Agency for International Development asked BOSTID to convene a workshop. Scientists and policy-level planners were brought together to review the state of the art in their respective disciplines and to recommend priorities in biotechnology research for international programs in agriculture, health and energy. Logistical considerations as well as considerations such as time frame for application to developing countries and the appropriateness for AID's and other donors' development objectives caused the participants to limit their discussions to recommendations on the following topics: vaccines, animal production, monoclonal antibodies, energy, biological nitrogen fixation, and plant cell and tissue culture.

PB83-169144/GAA PC **A16**/MF **A01**
International Harvester Co., Hinsdale, IL.
Methanol from Landfill Gas: Technology and Economics.
Final rept.,
J. Bradford Hollomon. Dec 82, 366p* NYSERDA-82-24

Keywords: *Methanol, *Fuels, Materials recovery, Cost analysis, Performance evaluation, Design criteria, Operating costs, Chemical analysis, Marketing, Economic analysis.

The study consists of a detailed conceptual process design for an integrated facility, including cost estimates and financial analysis; the results of a laboratory investigation of the composition of gas from the Fresh Kills landfill on Staten Island; and a market analysis of potential methanol uses and plant sites in New York State. The report addresses the conditions under which operation of a methanol plant would be economical, as well as strategies for introducing methanol into the marketplace. In addition, the report includes details on the extensive chemical data developed during the project concerning contaminants which might affect process performance or economics.

PB83-169284/GAA PC **A16**/MF **A01**
National Agricultural Library, Beltsville, MD.
Aquaculture Research - A Directory of USDA (United States Department of Agriculture) and State Projects in CRIS (Current Research Information System).
Jan 83, 362p* MPUB-1432
Prepared in cooperation with Cooperative State Research Service, Washington, DC.

Keywords: *Information sources, *Aquaculture, *Research and development, National government, State government, Project planning, Research projects, Animal nutrition, Animal behavior, Breeding, Genetics, Aquatic biology, Marine biology, Lagoons(Ponds), Sea grasses, Microbiology, Ecology, Harvesting, Marketing, Economic factors, Spartina alterniflora, Salt marshes.

Contents:
- Biology and behavior;
- Breeding and genetics;
- Diseases, parasites, pests, weeds;
- Ecology and environment;
- Feeding and nutrition;
- Production management systems;
- Harvesting and handling;
- Processing and product development;
- Product quality, nutritive value, consumption;
- Marketing and economics.

PB83-169359/GAA PC **A05**/MF **A01**
Transportation Research Board, Washington, DC.
Segmental and System Bridge Construction; Concrete Box Girder and Steel Design,
James C. Tail. 1982, 90p TRB/TRR-871, ISBN-0-309-03400-0
Library of Congress catalog card no. 83-2218. Also pub. in ISSN-0361-1981.
Paper copy also available from Transportation Research Board, 2101 Costitution Ave., NW, Washington, DC. 20418.

Keywords: *Bridges, Box beams, Precast concrete, Cantilever beams, Girder bridges, Wooden bridges, Bridge decks, Dynamic loads, Steel structures.

The 15 papers in this report deal with the following areas: I-205 over Columbia River Bridge: geometric control for cast-in-place and precast segmental box-girder construction; current practices in systems construction of concrete bridge structures; system construction of medium-span bridges in prestressed concrete; segmental construction of medium-span bridges in prestressed concrete; segmental construction for concrete and steel bridges that incorporate positioning; full-span form panels for highway bridges; precast concrete deck modules for bridge deck reconstruction; eleven-year performance of two precast, prestressed concrete bridge decks; Bebo concrete arch structural system; bridge structure construction system that uses treated lumber; live load distribution in concrete box-girder bridges; and, design of a skew, reinforced concrete box-girder bridge model.

PB83-169474/GAA PC **A04**/MF **A01**
National Agricultural Library, Beltsville, MD.
Directory of Aquaculture Information Resources.
Bibliographies and Literature of Agriculture.
Dec 82, 69p BLA-25
Prepared in cooperation with Aspen Systems Corp., Germantown, MD.

Keywords: *Aquaculture, *Information Sources, Information centers, Libraries, Surveys, Fishes, Services.

This Directory was compiled by Aspen Systems Corporation in response to questionnaires developed by them with cooperation and guidance from the National Agricultural Library (NAL). Aquaculture is generally defined as the controlled cultivation and harvest of aquatic animals and plants, including finfish, crustaceans, mollusks, and seaweed. In the United States, it consists primarily of production of fish for human consumption, but stock for commerical and sport fisheries, bait, and ornamental fish are also important.

PB83-169920/GAA PC **A06**/MF **A01**
Crain and Associates, Inc., Los Altos, CA.
Development of TSM (Transportation System Management) Programs in the San Francisco Bay Area.
Final rept.,
David Curry, Burton Crowell, and David Reinke. Sep 82, 125p UMTA-CA/MT-82/100
Contract UMTA-CA-09-8004/8007
Sponsored in part by California State Dept. of Transportation, Sacramento.

Keywords: *Transportation management, *Urban planning, *Motor vehicles, Rapid transit railways, Interchanges, Traffic engineering, Parking facilities, California, San Francisco(California).

The report describes and evaluates the planning and development process for transportation system management (TSM) in the San Francisco Bay Area. Case studies of a dozen illustrative TSM projects are presented and compared, including ramp metering, park and ride lots, neighborhood traffic constraints, flextime, urban parking policies, training employer transportation coordinators, and regional transit coordinating committees. The effectiveness of the regional TSM planning process is appraised and suggestions for improvement are offered.

PB83-170407/GAA
(Order as PB83-170308/GAA, PC **A13**/MF **A01**)
Texas Agricultural Experiment Station, College Station.
Quality of Irrigation Return Flow from Flooded Rice Paddies,
K. W. Brown. Dec 82, 37p
Included in Proceedings of the Workshop on Agrichemicals and Estuarine Productivity, p139-175 Dec 82.

Keywords: *Rice, *Irrigation, *Water pollution, Rice plants, Catfishes, Pesticides, Fertilizers.

A 3-year field and laboratory study was conducted to determine the quantity and quality of irrigation return flow from flooded rice culture. Both intermittent and continuous-flow irrigation techniques were evaluated. Selected pesticides and nutrients were applied at recommended and excessive rates. The concentrations of nitrate, phosphate, and potassium in the return flow were all within levels acceptable for drinking water.

PB83-170696/GAA PC **A11**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Toxicological Principles for the Safety Assessment of Direct Food Additives and Color Additives Used in Food.
1982,
1982, 250p*

Keywords: *Food, National government, *Safety, Assessments, Criteria, Tests, Standards, Risk, Food and Drug Administration, Carcinogenesis.

During the past two decades, significant changes have taken place both with respect to the technology of food production and processing, including the use of additives, and also with respect to the scientific criteria used to establish the safety of additives. The report results from work that the agency has recently undertaken to develop scientific criteria for establishing the safety of new additives, and to assure their continued safety in view of possible trends in their use levels and the constantly evolving scientific criteria for safety evaluation. The system outlined in the document has been designed to apply to direct food additives and to color additives used in food but not to indirect food additives. Throughout the document, the term 'additive' is used to denote both direct food additives and color additives used in food.

PB83-172528/GAA PC **A11**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
Manual of Practice for Wastewater Neutralization and Precipitation.
Final rept. Jun 77-Oct 80,
A. S. Goldfarb, C. Vanessa Fong, W. Lowenbach, W. A. Parsons, and P. Aarne Vesilind. Aug 81, 247p
EPA-600/2-81-148
Grant EPA-R-805623
Prepared in cooperation with Davy McKee Corp., Cleveland, OH., and Duke Univ., Durham, NC. Dept. of Civil Enginering.

Keywords: *Water pollution, *Waste water treatment, Design criteria, Performance evaluation, Calcium oxides, Industrial waste treatment.

This document describes a systematic procedure for conceptualizing and designing neutralization and precipitation systems. It is for use by engineers qualified to design facilities of this type, not for the novice. It can help the equipment purchaser become a more intelligent consumer and will provide technical guidance on many design considerations. The manual uses many references because of the breadth of this subject. One colume could not contain all of the necessary background information.

PB83-172957/GAA PC **E04**/MF **E04**
Commission of the European Communities, Luxembourg.
Technico-Economic Analysis of Large Scale Uses of Oxygen.
Final rept.,
A. C. C. Tseung, H. C. Chan, and D. B. Hibbert. c1982, 63p EUR-7938-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Keywords: *Oxygen, *Industrial plants, Marketing, Water, Byproducts, Electrolysis, Economic analysis, Feasibility, Insitu processing, Coal gasification, Chemical industry, Metal industry, Sewage treatment, Medicine, Combustion.

The potential markets and uses for oxygen, a co product of hydrogen in the electrolysis of water, based on nuclear off-peak electricity, have been investigated. Possible new large-scale uses have been examined, e.g., in underground coal gasification, enriched air combustion, blast furnace operation, manufacture of chemicals and production of synthetic natural gas from coal. The feasibility of a novel method of underwater storage of oxygen has been assessed and the cost of various transportation methods have been reviewed.

PB83-173054/GAA PC **A04**/MF **A01**
California State Dept. of Transportation, Sacramento. Office of Transportation Lab.

Evaluation of Weathering Effects on Structural Steel.
Final rept. 1980-82,
Franklin O. Reed, and Charles B. Kendrick. Mar 82, 73p 636955, FHWA/CA/TL-82/04

Keywords: *Steel industry, Evaluation, *Corrosion, Corrosion resistance, Corrosion tests, Steel A7, Steel A242, Steel A588, Steel A514.

The corrosion rates of ASTM A7, A242 Type 1, A588 Grades B, G and H, and A514 Grades D, E and F steels are compared after weathering 13 years in suburban and industrial environments with low rainfall and in a marine environment located, respectively, at Sacramento, Los Angeles and Point Reyes, California. Four types of specimens were prepared from each steel for each environment, namely: (1) plate with butt and surface welds, (2) plate with back to back angles tack welded to it, (3) plate with spaced angles welded to it, and (4) plate with an angle bolted to it.

PB83-173849/GAA PC **A10**/MF **A01**
National Research Council, Washington, DC.
Contraception: Science, Technology, and Application.
Final rept.
1979, 219p ISBN-0-309-02892-2, ISBN-0-309-02892-2
Contract PHS-263-78-C-0209
Sponsored in part by Ford Foundation, New York, Population Council, New York, and Rockefeller Foundation, New York. Proceedings of a symposium held on May 16-17, 1978. Library of Congress catalog card no. 79-20744.

Keywords: *Population control, *Contraceptives, *Birth control, Humans, Developing countries, Fertility, Population growth, Hormones, Psychology, Sociology, Costs, Immunology, Gonadotropin, Vaccines, Funds.

This report of a symposium reflects a growing concern with the problem of population growth and the social and economic challenge it presents to the people of essentially all nations. The papers present a wide variety of expertise in contraceptive technology. The first papers concern the state of contraception today throughout the world. The second group of papers is devoted to descriptions of new methods and research horizons. The last group of papers address the psychosocial aspects of contraception.

PB83-174086/GAA PC **A03**/MF **A01**
National Research Council, Washington, DC.
Assessment of Basic Field Surveys of Nutritional Status in Young Children (Monograph No. 1) as It Related to National Nutrition Surveillance.
Final rept.
1979, 39p
Contract AID/TA-C-1428

Keywords: *Nutrition, Assessments, *Children, Surveillance, Anemia.

This report was undertaken to assess a document developed by the U.S. Agency for International Development designed to assess the magnitude and location of probable malnutrition using selected anthropometric, biochemical, clinical, and demographic indices. The report concludes that rigorous application of the Basic Field Survey (BFS) will produce reliable estimates of the prevalence of different degrees of wasting, stunting, and anemia at national and local levels and that these estimates will be useful in nutrition planning.

PB83-174201/GAA PC **A04**/MF **A01**
National Research Council, Washington, DC.
Summary Report of the National Academy of Sciences Panel on Science and Technology in Jordanian Development, Amman, Jordan, July 27 - August 4, 1979.
1979, 54p
Contract AID/ta-C-1433

Keywords: *Technology assessment, *Technology transfer, *Jordan, Cooperation, Policies, Quality of life, Organizations, Developing countries.

A six-member National Academy of Sciences team visited Jordan July 27 - August 4, 1979 to outline priority needs in science and technology for development and consider areas for cooperation between the Jordanian and U.S. scientific communities. This report seeks to do the following: (1) To define ways by which enhanced collaboration between Jordan and the United States can make use of the scientific and technological resources in Jordan, the United States, and elsewhere in the world to improve the quality of life for the Jordanian people; (2) To define an organizational framework for the formulation and implementation of policies that will strengthen the links between science and technology and the development process; and (3) To suggest ways by which joint activities between the National Planning Council of Jordan and the U.S. National Academy of Sciences, and between the NPC and other agencies and institutions, both public and private, can make better use of science and technology to solve critical problems in the areas of water, energy, agriculture, environment, industry, and manpower.

PB83-175034/GAA PC **A04**/MF **A01**
Science Applications, Inc., Bryan, TX.
Bay of Bengal - A System to Evaluate Storm Surge Threat.
Final rept.,
Jerry D. Jarrell, James K. Lewis, and Robert E. Whitaker. Apr 82, 61p
Contract AID/SOD/PDC-C-0294

Keywords: *Meterology, Mathematical models, Wind velocity, Errors, *Tropical regions, Height.

A method for evaluating storm surge threat throughout the Bay of Bengal is presented. The method is based on the statistical characteristics of errors in forecasting the position and maximum winds for any given tropical storm in the Bay. These statistical characteristics allow one to calculate the probability that a storm will be in a particular location with a particular maximum wind speed.

PB83-176222/GAA PC **A06**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Study of Size and Shape of Plots for Field Experiments on Vegetable and Perennial Crops (RE-ANNOUNCEMENT of PB82-261223 - see notes field for explanation),
D. Singh, P. N. Bhargava, R. K. Khosla, and Asha Saksena. 1975, 106p
RE-ANNOUNCEMENT of PB82-261223 with corrected title.

Keywords: *Vegetables, *Crops, *India, Experimental data, Tomatoes, Size determination, Fruit crops, Coefficient of variation, Trees(Plants), Developing country application, Perennials.

In agricultural experiments the experimenter is generally faced with the problem of adopting the suitable size and shape of the plot so that he can obtain the maximum information from his experimental material. The present monograph gives the results of the studies made on vegetable crops like Bhindi, Tomato, Cabbage, Knol-Khol and on perennial Crops like Coconut, Pepper, Arecanut, Mango, Orange, Apple and Banana. This monograph will prove useful to the research workers for agricultural field experiments.

PB83-176248/GAA PC **A09**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Conference of Agricultural Research Statisticians (3rd), 24th to 26th April, 1978: Abstract of Contributed Papers and Proceedings (RE-ANNOUNCEMENT of PB83-115279 - see notes field for explanation),
R. K. Khosla, R. S. Khatri, D. S. Aneja, D. P. Singh, and S. D. Bal. 1978, 176p
RE-ANNOUNCEMENT of PB83-115279 with a different Corporate Author.

Keywords: *Agriculture, *India, Abstracts, Forestry, Statistical analysis, Livestock, Fisheries, Data processing, Personnel development, Developing country application.

The Third Conference was held recently from 24th to 26th April, 1978 and unlike earlier two conferences the pattern of session was changed where the participants discussed the main topic i.e., the role of agricultural statistics research in Sixth Five Year Plan with special reference to integrated rural development with respect to agriculture, forestry, livestock and fisheries. This was done because one of the main policy objectives in the next Five Year Plan is the Agricultural and Rural Development which could play a great role in the growth of social justice, employment in rural areas and removal of poverty.

PB83-176255/GAA PC **A10**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Conference of Agricultural Research Statisticians (5th), 23rd to 26th December, 1980: Contributed Papers and Proceedings (RE-ANNOUNCEMENT of PB83-115337 - see notes field for explanation),
R. K. Khosla, D. S. Aneja, and Madan Mohan. 1980, 225p
RE-ANNOUNCEMENT of PB83-115337 with a different Corporate Author.

Keywords: *Agriculture, *India, Research projects, Statistical analysis, Surveys, Farm crops, Livestock, Forestry, Fisheries, Rural areas, Economic development, Developing country application.

In this Conference a total number of 215 Agricultural Statisticians representing Agricultural Universities, ICAR Institutes, State and Central Departments of Agriculture, Animal Husbandry, Forestry and Fisheries, engaged in research, participated. The objective of mutually discussing the problems by them on: Design and analysis of experiments; Sample surveys; Use of computer in Agriculture and Animal Sciences Research; Statistical techniques in plant and animal breeding; Teaching of statistics in Agricultural Institutes and Universities; and Research and Training Facilities is reported.

PB83-176263/GAA PC **A12**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Annual Conference of Agricultural Research Statisticians (2nd), 29th to 31st March, 1976: Contributed Papers and Proceedings (RE-ANNOUNCEMENT of PB83-115261 - see notes field for explanation),
R. K. Khosla, and R. S. Khatri. 1976, 274p
RE-ANNOUNCEMENT of PB83-115261 with a different Corporate Author.

Keywords: *Agriculture, *India, Statistical analysis, Experimental design, Surveys, Animal husbandry, Plant reproduction, Breeding, Education, Universities, Developing country application.

The First Conference of the Agricultural Research Statisticians was held with the objective of providing opportunities to Agricultural Research Statisticians to exchange ideas among themselves from 25th to 28th April, 1974. There were 17 papers which were contributed in those sessions by the invited speakers, engaged in Agricultural and Animal Sciences Research at various Institutes and Agricultural Universities.

PB83-176636/GAA PC **A99**/MF **A01**
Environmental Protection Agency, Washington, DC. Effluent Guidelines Div.
Test Methods for Nonconventional Pesticides Chemicals Analysis of Industrial and Municipal Wastewater,
George M. Jett. Jan 83, 694p EPA-440/1-83/079C

Keywords: *Industrial wastes, *Pesticides, *Waste water, Chemical analysis, Gas chromatography, Mass spectroscopy, Thin layer chromatography, Laboratory equipment, Quality assurance, Quality control, Safety, Point sources, High performance liquid chromatography.

This document presents the findings of studies of the pesticide chemicals point source category for the purpose of developing test methods for the analysis of 66 of the 137 nonconventional pesticide pollutants for which effluent limitations guidelines and standards were proposed on November 30, 1982. These test methods are proposed under authority of Sections 304(h) and 501(a) of the Clean Water Act, 33 U.S.C. 1251 et. 5eg. (the Federal Water Pollution Control Act Amendments of 1972) (the 'Act'). This document contains compilation of three sets of methods: those developed by industry, those developed by the contractor and those developed/approved by EMSL. Quality assurance (QA) requirements for the collection, preservation and handling of samples and requirements of quality control (QC) and safety are also contained in this report. Supporting data and rationale for the test methods are contained in this report and supporting file records.

PB83-176693/GAA PC **A03**/MF **A01**
Transportation Research Board, Washington, DC.
Coordination of Transportation System Management and Land Use Management.
Final rept.
Sep 82, 46p TRB/NCHRP/SYN-93, ISBN-0-309-03454-X
Also pub. in ISSN-0547-5570. Library of Congress catalog card no. 82-51209. Report on National Cooperative Highway Research Program, Synthesis of Highway Practice. Sponsored in part by American Association of State Highway and Transportation Officials, Washington, DC. and Federal Highway Administration, Washington, DC.

Keywords: *Transportation management, *Land use, Systems management, Coordination, Planning.

This synthesis will be of particular interest to transportation planners, administrators, traffic engineers, and others concerned with the relationship between transportation facilities and land use. The interaction of transportation systems management and land use management techniques is analyzed for various environments and applications. Because increased emphasis is being placed on more efficient use of existing transportation facilities, it is important to understand how the interaction of land use management techniques and transportation system management can be used to achieve desired development and transportation objectives. This report of the Transportation Research Board contains a review of the application of currently used techniques in various operating environments and includes a discussion of research needs.

PB83-177592/GAA PC **A06**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
Energy from Biomass: The Implications of Gasohol from Corn,
L. C. Newman, and R. Channing Johnson. Dec 80, 110p MP-81W6, NSF/PRA-7817621/4
Grant NSF-PRA78-17621
See also PB83-177600.

Keywords: *Crops, *Biomass, *Corn, Farm crops, Fuel, Agricultural products, Technology, Distillation, Byproducts, *Gasohol.

The major components of the gasohol system discussed are cropland, corn production and use, distilleries, use of distillation by-products in the various feeding sectors, automobiles and the automotive companies, gasoline and the petroleum companies, and gasohol and driver satisfaction. Economic and agricultural impacts, energy supply, employment, and governmental implications are examined. The implications of developing an alcohol program of two billion gallons per year appear to be acceptable. The most significant disadvantages are believed to be associated with the net land demand. These impacts include a higher fixed cost of farming and increased environmental damage and variability of corn supply. Net land demand is reduced if the distillation by-products are substituted against soybean meal for their protein value rather than used on feedlots for their energy value. An external evaluation of this report was conducted by the Division of Policy Research and Analysis of the National Science Foundation and is appended to the main volume of this series.

PB83-177600/GAA PC **A04**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
Energy from Biomass: The Implications of Industrial Use of Wood,
Martin Jones, Richard Jones, and Charles Bliss. Dec 80, 65p MP-81W5, NSF/PRA-7817621/5
Grant NSF-PRA78-17621
See also PB-177618.

Keywords: *Energy, *Biomass, *Wood, *Industrial plants, Technology, Marketing, Fuels, Substitutes, Environmental impacts, Steam electric power generation, Design criteria.

The use of wood by industry to generate heat and electricity is examined; and potential issues arising from the widespread use of these technologies are identified and discussed. The report presents (1) an overview of the technology and the market--industrial steam generation, the role of cogeneration, and potential effects of increased use of fuelwood to replace petroleum fuels or natural gas; (2) the institutional setting, involving present and potential industrial users, suppliers, government and other users, and a discussion of specific barriers to further commercialization; (3) economic and environmental impacts including air and water pollution, and solid wastes; and (4) public policy options to monitor future growth of industrial wood combustion applications and prevent or minimize potential adverse impacts. An external evaluation of this report was conducted by the Division of Policy Research and Analysis of the National Science Foundation and is appended to the main volume of this series.

PB83-177618/GAA PC **A04**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
Energy from Biomass: The Implications of Methanol from Silvicultural Farms,
L. C. Newman, and R. Channing Johnson. Dec 80, 74p MP-81W8, NSF/PRA-7817621/6
Grant NSF-PRA78-17621
See also PB83-177626.

Keywords: *Energy, *Biomass, *Methanol, Farms, Technology, Wood, Fuels, Silviculture.

Examined is the conversion of wood from a silvicultural energy farm into methanol for use as a transportation fuel. Specific impacts and issues of silvicultural farming are separated, as far as possible, from impacts and issues associated with the production and use of methanol. The report presents (1) characteristics of producing methanol from wood; (2) the commercialization outlook based on the overall energy context of the United States; (3) a description of primary stakeholders, such as methanol manufacturers and land managers; (4) a description of secondary stakeholders such as the United States Department of Agriculture and Environmental Protection Agency; (5) implications of a methanol program, such as placing a methanol facility in the community and impacts on the automotive industry; and (6) an analysis of policy options--approaches to encouraging or discouraging the commercialization of methanol fuel from biomass. An external evaluation of this report was conducted by the Division of Policy Research and Analysis of the National Science Foundation and is appended to the main volume of this series.

PB83-177626/GAA PC **A04**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
Energy from Biomass: The Implications of Residential Heating with Wood,
L. C. Newman, and Martin Jones. Dec 80, 70p MP-81W7, NSF/PRA-7817621/7
Grant NSF-PRA78-17621
See also PB83-177634.

Keywords: *Energy, *Biomass, *Wood, *Buildings, Heating, Technology, Markets, Forecasting, Cost analysis.

The use of wood for residential heating is examined and potential issues arising from the increasingly widespread use of wood fuel are identified and discussed. The report presents (1) an overview of the technology and the market, including comparative costs; (2) the institutional setting, involving potential users, systems providers, and government, and barriers to communication; (3) economic, environmental, legal, social and political impacts; (4) public policy options, including objectives, basic strategy, limitations, market place incentives; and (5) a twenty-year projection of residential wood energy utilization. Also residential use beyond the year 2000 is forecast.

PB83-177634/GAA PC **A16**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
Energy from Biomass: A Technology Assessment of Terrestrial Biomass Systems,
Lawrence C. Newman, R. Channing Johnson, and Rodney K. Lay. Dec 80, 365p MTR-80W259, NSF/PRA-7817621/1
Grant NSF-PRA78-17621
See also PB83-177576.

Keywords: *Energy, *Technology assessment, *Biomass, Technology, Assessments, Corn, Wood, Residential buildings, Heating, Industrial plants, Methyl alcohol, Forecasting, Environmental impacts, Economic analysis, Fuels, Gasohol, Silviculture.

In this technology assessment, the consequences of the commercial development of four biomass systems were examined. The impacts of such development on selected aspects of government, private industry, and the population in general were analyzed from a public policy perspective. The study also identified policy issues likely to result from the development of biomass energy. Four biomass systems were studied: (1) gasohol production from corn; (2) residential heating with wood; (3) industrial use of wood energy; and (4) methanol production from silvicultural farms. The development scenarios selected for study were based on three levels of sustained annual biomass production by the year 2000. These were (1) 4.1 quadrillion BTUs (quads), a baseline business-as-usual scenario; (2) 10.5 quads, a crisis of supply scenario; and (3) 2.2 quads, a cheap energy scenario. An external evaluation of this report was conducted by the Division of Policy Research and Analysis of the National Science Foundation, and is included, together with a response to the evaluation by the principal investigator of the report.

PB83-177964/GAA PC **A04**/MF **A01**
Utah Water Research Lab., Logan.
Water Requirements and Pollutant Potential in the Gasification of Carbonaceous Shales.
Water Quality series rept.,
Jeffery A. Cissell, V. Dean Adams, Joel E. Fletcher, Daniel S. Filip, and Dennis B. George. Oct 82, 68p UWRL/Q-82/04, W83-02211, , OWRT-A-043-UT(1)
Contract DI-14-34-0001-9047

Keywords: *Gasification, *Water pollution, Coal gasification, Technology, Industrial wastes, Feasibility, Laboratory equipment.

The Upper Colorado River Basin has vast deposits of lignaceous shales which now go largely unused but could potentially provide a valuable product through gasification. The technical feasibility of applying gasification processes currently used for coal, the water requirements of gasification in an arid climate, and potential pollution problems were examined through a series of laboratory studies. Quantities of phenols, ammonia-N, and total organic carbon produced were significantly less for the shales tested than for the coal. Differences in process condensate constituents, such as mutagenicity and trace elements, were also determined for the coal and shale samples. Results varied widely with the chemical characterization of the coal and shale.

PB83-177998/GAA PC **A06**/MF **A01**
Puerto Rico Univ., Mayaguez. Water Resources Research Inst.
Packed-Bed Reactors for Concentrated-Waste Treatment and Energy Production.
Final completion rept.,
Knud B. Pedersen. 1983, 105p W83,-02214, , OWRT-A-052-PR(1)
Contract DI-14-34-0001-9041

Keywords: *Water pollution, *Methane, *Puerto Rico, Filtration, Sludge disposal, Sewage treatment, Industrial waste treatment, Fuels, Design criteria, Performance evaluation, Organic compounds.

The objective of this research project was to study the design parameters of the anaerobic filter process such as organic loadings and hydraulic retention time, and the response of the process in relation to organic matter removal and energy production for a typical condition in Puerto Rico. The organic loading was found to be a very important parameter during the operation of the anaerobic filter. The activity of the filter in removing organic matter evidenced the dependence on the applied organic loading. The continuous variations of the organic loading rates and the considerably high magnitude of such loads in addition to the high concentration of suspended solids could result in dynamic fluctuations between the individual waste components affecting the steady state condition of the organic conversion process causing that none of the three conditions studied have shown a significant improvement in the organic removal and in the gas production rate.

PB83-179994/GAA PC **A07**/MF **A01**
Cornell Univ., Ithaca, NY.
Whey Protein Concentrate Market Enhancement.
Final rept.,

Robert R. Zall, Arthur H. Teixeira, and Joseph H. Chen. Sep 82, 134p NYSERDA-82-29
Prepared in cooperation with Little (Arthur D.), Inc., Cambridge, MA.

Keywords: *Marketing, Alcohol, *Proteins, Food composition, Profits.

The report describes results of an investigation into the marketability and potential uses for whey protein concentrate (WPC), a co-product formed in the process of converting cheese whey to ethanol. With more than four billion pounds of whey produced annually in New York State, conversion to ethanol and WPC is warranted for both environmental and economic reasons.

PB83-180125/GAA PC **A03**/MF **A01**
National Marine Fisheries Service, Seattle, WA.
Economic Analysis of Fishing Industry Energy Conservation Technology,
A. Nelson Swartz. Jan 83, 32p NOAA-TM-NMFS-F/NWC-39, NOAA-83031408

Keywords: *Fishes, *Technology assessment, *Economic analysis, Cost analysis, Ships, Life-cycle cost.

This paper is intended to familiarize the reader with life-cycle analysis and to demonstrate the application of these tools on a representative fishing vessel.

PB83-180232/GAA PC **A05**/MF **A01**
Environmental Protection Agency, Ann Arbor, MI. Emission Control Technology Div.
Preliminary Perspective on Pure Methanol Fuel for Transportation.
Final rept.
Sep 82, 100p EPA-460/3-83-003

Keywords: *Methanol, *Motor vehicles, *Fuels, Exhaust emissions, Economic analysis, Fuel consumption, Technology, Performance evaluation, Sources, Biomass, Manufacturing.

This report examines the relative advantages and disadvantages of the use of pure methanol fuel in motor vehicles designed for its use over conventional fuels. This report specifically addresses the use of pure or neat methanol it does not address methanol gasoline blends for use in existing automobiles. Five basic issues are discussed: (1) The availability of raw materials for methanol production such as coal, natural gas, wood, biomass, municipal waste and peat. (2) The relative availability of technology and environmental effects of producing methanol and conventional fuels from non-petroleum domestic feedstocks. (3) The practicality of distributing a new fuel for use in motor vehicles. (4) The exhaust emissions and fuel efficiency of motor vehicles operating on pure methanol fuel relative to those of conventional vehicles. (5) The economics of producing, distributing and using methanol as a motor vehicle fuel.

PB83-180596/GAA PC **A07**/MF **A01**
Federal Highway Administration, Washington, DC. Office of Highway Planning.
Public Transportation for Rural and Small Urban Areas: A Report on Coordination in 12 Selected Section 18 Projects.
Final rept.,
Francis J. Dooley. Nov 82, 127p FHWA/PL/82/003

Keywords: *Rural areas, *Transportation, Federal assistance programs, Financing, State government, National government, Urban areas, Performance evaluation.

This report assesses the progress of coordination efforts in the Section 18 Formula Grant Program for Areas Other Than Urbanized Areas authorized by the Surface Transportation Assistance Act of 1978. Progress is assessed by analyses and summarization of 12 selected case studies consisting of 3 Small Urban Area Transit Systems and 9 Rural Area Transit Systems. Funding, coordination activities and performance indicators are included in each case study.

PB83-181958/GAA PC **A03**/MF **A01**
Massachusetts Univ., Amherst. Water Resources Research Center.
Microbiological Control of the Aquatic Weed, 'Myriophyllum Spp.',
Haim B. Gunner. Jun 82, 30p PUB-129, W83-02321, , OWRT-B-066-MASS(2)
Contract DI-14-34-001-9076

Keywords: *Pest control, *Water pollution, *Microbiology, *Weed control, Fungi, Cyanophyta, Algae, Decomposition, Myriophyllum.

Bacteria, fungi and blue-green algae normally associated with the phyllosphere of Myriophyllum heterophyllum and Myriophyllum spicatum are among the principal decomposers of senescent plants. Stripped of this flora by various sterilizing techniques, the Myriophyllum extended its life by one third. The saprophytic process of decomposition was accelerated to pathogenesis by selecting from the community of microbial decomposers isolates which, when cultured on the appropriate cellulose and pectin media, could be induced to produce enzymes lytic to these tissues and ultimately lethal to the plant. The results suggest that microorganisms native to the Myriophyllum ecosystem, selected for specific plant tissue attack, offer a promising avenue for the biological control of these aquatic nuisance plants.

PB83-182055/GAA PC **A08**/MF **A01**
Arizona Water Resources Research Center, Tucson.
Bibliography on Ground-Water Recharge in Arid and Semiarid Areas,
Susan J. Keith, Patricia Paylore, K. J. DeCook, and L. G. Wilson. Jul 82, 158p W83-02362, , OWRT-C-00155-T(1483)(1)
Contract DI-14-34-0001-1483

Keywords: *Ground water, *Arid land, Channels(Waterways), Streams, Mountains, Precipitation(Meteorology), Fluid infiltration.

This bibliography provides references on natural and mancaused recharge in arid and semiarid areas. The literature on natural recharge includes citations on stream channel recharge, mountain recharge, mountain-front recharge, and precipitation-infiltration recharge. The literature on man-caused recharge includes citations on recharge from activities such as irrigation, mining, and waste-water treatment and disposal.

PB83-182261/GAA PC **A09**/MF **A01**
District of Columbia Univ., Washington. Water Resources Research Center.
Urban Planning Criteria for Non-Point Source Water Pollution Control.
Final rept.,
G. Kenneth Young, and David L. Danner. 31 Mar 82, 178p DC/WRRC-35, W83-02317, , OWRT-A-009-DC(1)
Contract DI-14-34-0001-1109
Prepared in cooperation with Catholic Univ. of America, Washington, DC. Dept. of Civil Engineering.

Keywords: *Urban planning, *Hydrology, *Time series analysis, Substitutes, Cost analysis, Sewers, Hydrology, Flushing.

The research described in this document couples urban storm runoff quality and control alternatives within the context of an urban sewerage system to evaluate various combinations of alternatives through their pollution removal efficiencies and their costs. A model has been developed which simulates the response of a typical urban area to a time series of rainfall events, and which uses the District of Columbia as an example. The modeling of the flow of runoff and sewage has been performed at a macro level; the control alternatives examined include in-line storage, sewer separation, street sweeping, sewer flushing, stormwater detention, and increased treatment capacity. Each pollution abatement measure is described with a pollution function, a pollution removal function, and a cost function.

PB83-182303/GAA PC **A07**/MF **A01**
Oklahoma State Univ., Stillwater. Dept. of Biochemistry.
Biochemical Analyses for Detection and Assessment of Pollution in the Subsurface Environment.
Final rept.,
Jenq. C. Chang, Andrea B. Arquitt, Rosalee Merz, Elizabeth R. Doyel, and Phyllis T. Norton. Mar 83, 143p EPA-600/2-83-021
Grant EPA-R-804613

Keywords: *Soils, *Environmental surveys, *Ground water, Water pollution, Samples, Enzymes, Proteins, Nucleic acids, Organic phosphates, Carbohydrates, Chemiluminescence, Bioluminescence, Escherichia, Enzymatic cycling.

Selected biochemical analysis techniques were investigated for potential use in detecting and assessing pollution of subsurface environments. Procedures for determining protein, nucleic acids, organic phosphate, lipopolysaccharides, and various coenzymes and enzyme systems were evaluated. These procedures were modified and adapted for application to environmental samples, and sensitivities were determined in terms of numbers of Escherichia coli cells which could be detected.

PB83-183020/GAA PC **A11**/MF **A01**
Instytut Ksztaltowania Srodowiska, Wroclaw (Poland).
Optimization of Wastes Treatment with Reference to Biogas and Protein Recovery.
Final rept.,
Jan A. Oleszkiewicz, and Szymon Koziarski. Mar 83, 249p EPA-600/2-83-023
Contract EPA-JB-5-534-7

Keywords: *Sewage treatment, *Proteins, *Manures, Biomass, Economic analysis, Anaerobic processes, Agricultural wastes, Sludge treatment, Performance evaluation, *Biogas.

Detailed technological and economic evaluation of the presently used treatment processes for the dilute wastewaters from hog farms, with capacity exceeding 10 thousand heads, is presented. The research part of the project was aimed at optimization of the unit process and whole treatment trains selection, rather than unit process operational parameters. The economic analysis has proved that the application of these new treatment trains can make industrial scale farming more profitable with the increase of the size of the farm. The technology proposed in the project will show increase of the economic efficiency, when compared to conventional systems, with the increase of power costs, due to biogas recovery and incorporation of sludge treatment subsystem in the overall treatment-recovery train. Although the report is confined to swine wastes, the results are applicable to other concentrated effluents from agricultural industry.

PB83-183129/GAA PC **A05**/MF **A01**
Oregon State Univ., Corvallis. Agricultural Experiment Station.
Utilization of Nickel Refining By-Products on Agricultural Lands.
Open file rept. 28 Jun 79-31 Dec 81,
V. V. Volk, E. H. Gardner, P. J. Sheets, and R. J. Gulack. 1 Mar 82, 89p BUMINES-OFR-62-83
Contract J0295058

Keywords: *Crops, *Fertilizers, *Soils, Plant growth, Utilization, Field tests, Laboratory equipment, Metal industry, *Nickel, Tailings, Refineries, Nutrients, Toxicity, Festuca arundinaceae.

Laboratory, greenhouse, and field experiments were conducted to determine the effects of a tailings material and a magnesium ammonium phosphate (MgAP), produced from a Ni refining operation, on plant growth and soil properties. All fertilizer materials provided similar levels of N and P, as evidenced by plant yield and elemental content.

PB83-183475/GAA PC **A07**/MF **A01**
Texas Governor's Office of Regional Development, Austin.
Procedimientos de Seminarios Sobre el Desarrollo Industrial/Economico (Summary of Proceedings - Industrial/Economic Development Seminars).
1980, 142p EDA-83-0002S
Text in Spanish. See also English version, PB83-183467.

Keywords: *Economic development, *Technical assistance, *Regional planning, Meetings, Commerce, Investments, Texas, *Industrial development, Proceedings, Foreign trade.

This handbook is based upon six industrial/economic development seminars hosted by the Governor's

Office of Regional Development throughout the Texas Border Regional during March and April, 1980. The purpose of the seminars was to further dialogue and exchange information on state-of-the-art industrial development procedures, efforts, and techniques.

PB83-183855/GAA PC **A02**/MF **A01**
Foreign Agricultural Service, Washington, DC.
Dairy Systems and Policies of Selected Western European Countries.
Foreign agriculture circular.
Mar 83, 21p CIRC SUPPL-4-83

Keywords: *Dairies, *Agricultural economics, Trends, Government policies, Western Europe, Milk, Production, Exports, Marketing.

Most nations of Western Europe have highly developed dairy industries. The European Community (EC) and selected countries of Western Europe are faced with surplus milk output. Dairy programs have been developed and implemented throughout most of Western Europe both to support incomes of farmers and to bring milk production into balance with demand. Many European governments subsidize dairy product sales both domestically and abroad and limit imports with various restrictions to protect internal markets from outside competition. Since the EC is the leading world trader of dairy products, policy changes related to dairy exports have a significant impact on international markets. A description of the dairy economies for these major milk producers is useful to evaluate the various methods being used to control excess milk output.

PB83-184135/GAA PC **E04**/MF **E04**
London Business School (England). Econometric Forecasting Unit.
Role of Time Series Analysis in the Estimation and Evaluation of Econometric Models,
J. A. Longbottom, and S. Holly. 1982, 46p CEF-DISCUSSION PAPER-97
Sponsored in part by Social Science Research Council, London (England).

Keywords: *Time series analysis, *Econometrics, Estimating, Performance evaluation, Economic forecasting.

The predictive performance of the London Business School model of the U.K. economy - a large nonlinear structural model - was compared with a time series model. Ex post and ex ante predictions were generated for periods from one to eight quarters ahead. In general, the structural model outperformed the time series model, although for some economic variables the time series model was found to be better. Time series techniques, theoretical relationships between time series and structural models, problems of model selection and comparison, single equation comparisons and possible strategies for selection were investigated.

PB83-184150/GAA PC **A06**/MF **A01**
Punjab Agricultural Univ., Ludhiana (India). Coll. of Veterinary Science.
Studies on the Control of Poultry Coccidiosis.
Final rept. 1 Jul 75-30 Jun 79.
1979, 125p

Keywords: *Poultry, *Animal diseases, Immunity, Disease control, Developing country application, Drug resistance, Coccida, Helminthiasis.

The objectives of the study were: (a) assessment of efficacy of coccidiostats against caecal intestinal coccidiosis; (b) studies on the effect of medication with the coccidiostats on the development of immunity; (c) studies on drug-resistance, if any, in field isolates of poultry coccidia; (d) characterization of lesions due to various species of coccidia; and (e) studies on the role of litter on coccidiosis and helminthiasis. The study revealed that 71.5% of 156 coccidial isolates made from the field were resistant to Sulphaquimoxaline, 58.8% to Bifuran and 34.1% to Amprolium. The use of these drugs would not control Coccidiosis on poultry farm in most cases. It is recommended that these drugs be replaced by newer broad-spectrum anticoccidial drugs; e.g. Coyden, Nicarbazin, Pancoxin, Amprolplus, Duocoxin, & Saquadil.

PB83-184168/GAA PC **E03**/MF **E03**
Open Univ., Milton Keynes (England). Energy Research Group.
Information Routing Groups. Getting the Information That You Did Not Know Was Needed Until It Arrived.
Research rept.,
D. C. Andrews. Jul 82, 15p ERG-037

Keywords: *Information systems, Data processing, Documentalists, Information retrieval, Information scientists, Consultants, Cooperation, Data bases.

The creation was proposed of information routing groups, IRGs, as a means of overcoming the relevance paradox, a phenomenon wherein important aspects of a problem are neglected because it is not known that they are relevant. The aims of the groups would be to ensure that all professionals have access to the correct informal knowledge about problems they have to tackle. Among the facilities offered by the IRGs would be: selling of articles, offering of consultancy, finding of business partners and development of private data bases. The structure, organization and operation of IRGs are discussed. Hardware and software development aspects are considered.

PB83-184200/GAA PC **E04**/MF **E04**
Building Research Station, Watford (England).
Ergonomic Requirements for Building Components and Associated Operating Devices,
S. A. Covington. c1982, 29p CP-1/82

Keywords: *Buildings, *Construction, Exercise(Physiology), Human factors engineering, Design criteria, Fatigue(Biology), Anthropometry.

Information was obtained on the functional strength of selected groups of people, within stated age ranges, to enable the ergonomic performance requirements for the design of building components to be specified. Comprehensive anthropometric data were determined from strength and ability tests relating to the operation of windows and doors. The operation of components and devices must be possible by the weaker groups of people, while the structural strength of such components must be able to withstand forces applied by stronger groups. Performance requirements for the operation of these components were developed. The data were considered relevant to the development of ergonomic performance requirements for associated products.

PB83-186817/GAA PC **A22**/MF **A01**
California Univ., Berkeley. Center for Planning and Development Research.
Proceedings of the P.R.C.-U.S.A. Joint Workshop on Earthquake Disaster Mitigation through Architecture, Urban Planning and Engineering Held at Beijing, China on November 2-6, 1981.
Final rept.
1982, 509p* NSF/CEE-82096
Grant NSF-CEE81-05229

Keywords: *Earthquakes, *Earthquake engineering, *Disasters, Urban planning, China, Land use, Buildings.

Twenty-five papers which were presented at a workshop on earthquake hazard mitigation are provided. The papers are grouped under three subtopics: (1) architectural and non-structural elements; (2) urban planning and land use; and (3) evaluation, strengthening and repairing of existing masonry structures. The relationship between building configurations and seismic performance for typical Western building types is examined and the earthquake performance of emergency service facilities is reviewed.

PB83-187575/GAA PC **A02**/MF **A01**
Bureau of Mines, Albany, OR. Albany Research Center.
Leaching Rates for the HCl Extraction of Aluminum from Calcined Kaolinitic Clay.
Rept. of investigations/1983,
R. S. Olsen, S. J. Bullard, W. G. Gruzensky, F. V. Mrazek, and J. L. Henry. Feb 83, 17p BUMINES-RI-8744
Library of Congress catalog card no. 82-600329.

Keywords: *Leaching, *Metals, *Aluminum, Hydrometallurgy, Extractive metallurgy, Hydrochloric acid, Aluminum.

The Bureau of Mines is engaged in research to recover aluminum from kaolinitic clay and other nonbauxitic domestic resources. As part of this work, calcined Georgia kaolin was prepared by a process that prevents slime formation and makes the leached residues fast settling and easy to filter. The leaching reaction for calcined kaolinitic clay in a 5 pct stoichiometric excess of boiling 23- to 26-pct HCl was found to be zero order. Rate constants based on the weight-fraction of aluminum in the clay were found to be between 0.095 and 0.15 min depending on feed preparation and leaching parameters. The mathematical relationships between aluminum extraction and time for both batch and continuous, stirred-tank operations were derived and verified experimentally.

PB83-187781/GAA PC **A04**/MF **A01**
Zellars-Williams, Inc., Lakeland, FL.
Evaluation of Potential Commercial Processes for the Production of Sulfuric Acid from Phosphogypsum.
Final rept.,
A. P. Kouloheris. Oct 81, 69p FIPR/PUB-01-002-001

Keywords: *Waste treatment, Byproducts, Gypsum, Technology, Feasibility, Process charting, Design criteria, Performance evaluation, Solid wastes.

Phosphogypsum is a synthetic by-product created during the commercial manufacture of phosphoric acid by the wet process. The synthetic phosphogypsum retains the basic chemical and physical properties of natural gypsum and can be substituted for natural gypsum in the manufacture of a variety of commercial products. The commercial incentives which justify the exploitation of byproduct phosphogypsum in nations which lack domestic gypsum sources and seek to avoid expensive imports are absent in Florida. This report documents the technical feasibility of substituting synthetic phosphogypsum for the natural gypsum used in an experimental process which recovers the commercial sulfur values liberated by the thermal decomposition of natural gypsum.

PB83-188615/GAA PC **A02**/MF **A01**
Northwestern Univ., Evanston, IL.
Mechanistic and Kinetic Studies of the Elementary Processes in Catalytic Combustion of Methane.
Annual rept. Sep 81-Aug 82,
Harold H. Kung, and John B. Butt. Oct 82, 18p GRI-81/0127
Contract GRI-5081-360-0481

Keywords: *Methane, Combustion, Oxidation, Decomposition, Surfaces.

This report describes the progress towards determining the kinetics and the mechanism in the catalytic oxidation of methane by studying the reaction of some postulated intermediates on a well-characterized surface. Current emphasis is on the intermediate methylene radical. Preparation of the precursor for methylene, diazomethane is briefly described. An initial result suggested that diazomethane on adsorption on platinum decomposed readily to gaseous nitrogen and an adsorbed carbonaceous species. On heating methane and ethylene are the major products in the absence of oxygen. In contrast, adsorbed ethylene does not undergo reaction before desorption. This evidence suggests that the decomposed product is the desired methylene radical.

PB83-188698/GAA PC **A03**/MF **A01**
Case Study Inst., Inc., Washington, DC.
Small-Business Innovation: An Annotated Bibliography.
Final rept.,
Gwendolyn Moore, and Mark Eads. Mar 83, 40p
ISBN-0-942570-01-4
Library of Congress catalog card no. 83-70062. Prepared in cooperation with Cosmos Corp., Washington, DC.

Keywords: *Small businesses, *Research and development.

The purpose of this study is to provide researchers, policymakers, and students of innovation with a starting point for gaining access to and using what is known about small-business innovation. The bibliography presents the core research on the study of small-business innovation.

PB83-189399/GAA PC **A03**/MF **A01**
Economics and Statistics Service, Washington, DC. National Economics Div.
Producing Ethanol from Grain: Agricultural Impacts and Feasibility.
Staff rept.,
Michael Le Blanc, and Anthony Prato. Aug 82, 50p AGES-820329

Keywords: *Ethanol, *Proteins, Byproducts, Feeding stuffs, Corn, Soybeans, Agricultural products, Fuels, Economic analysis, Feasibility.

The Energy Security Act sets an alcohol production goal of at least 10 percent of the level of gasoline consumption in 1990. Such a high level of alcohol production, 8.4 billion gallons, is likely to have significant impacts on agricultural production, commodity prices, and farm income. If corn is the primary feedstock for ethanol production, the greatest impacts will occur in the corn and soybean subsectors. The soybean subsector is affected because the process of converting corn to ethanol produces high protein byproducts which can substitute for soybean meal in livestock rations.

PB83-190033/GAA PC **A08**/MF **A01**
Department of Agriculture, Washington, DC.
Controlled Atmosphere Storage of Fruits ,
L. V. Metlitskii, E. G. Sal'kova, N. L. Volkind, V. I. Bondarev, and V. Ya. Yanyuk. c1972, 158p TT-75-52002
Trans. of mono. Khranenie Plodov v Reguliruemoi Gazovoi Srede, Moscow, 1972.

Keywords: *Fruits, Controlled atmospheres, *Food storage, Packaging materials, Books, Oxygen, Carbon dioxide, Nitrogen, Recommendations, USSR, Translations.

The storage of fruits in controlled atmosphere is one of the most advanced methods of fruit storage. It reduces losses, increases periods of storage and best preserves the taste and aroma of fruits. This book describes the biochemical basis of storage in controlled atmosphere. The description is based on the experience gained in the Soviet Union and abroad on storage of fruits in special chambers with controlled atmosphere, where the content of oxygen, carbon dioxide and nitrogen is regulated. It also examines the prospects of storage of fruits in selectively permeable packing.

PB83-190272/GAA PC **A15**/MF **A01**
Cornell Univ., Ithaca, NY.
Resource Conservation and Utilization in Animal Waste Management. Volume I. Utilization of Animal Manures as Feedstuffs for Livestock and Poultry.
Final rept.,
John H. Martin, Jr., Raymond C. Loehr, and Thomas E. Pilbeam. Mar 83, 337p EPA-600/2-83-024A
Grant EPA-R-806140
See also Volume 2, PB83-190280.
Also available in set of 3 reports PC E99, PB83-190264.

Keywords: *Waste management, *Agricultural wastes, *Animal feeds, Waste disposal, Cattle, Poultry, Swine, Cost effectiveness, Rations, Performance evaluation, Fertilizers, Market value, *Manures.

Use of animal manures as feedstuffs has been suggested as a method to: (1) reduce the cost of producing animal products, and (2) reduce or alleviate potential air and water pollution problems associated with animal manures. This study assembled, critically reviewed and analyzed reported information pertaining to the nutrient characteristics of animal manures and their nutritive value when utilized as feedstuffs in feeding trials. The evaluation focused on dairy cattle, beef cattle, and caged laying hen manures, and broiler litter utilized as feedstuffs for cattle and poultry. Based on the results of feeding trials, the assessment of the nutritive value of animal manures indicated that generally less than 25% of the manures could be incorporated into rations without adversely affecting animal performance. The estimated economic value of the manures was highly variable.

PB83-190280/GAA PC **A04**/MF **A01**
Cornell Univ., Ithaca, NY.
Resource Conservation and Utilization in Animal Waste Management. Volume II. Use of Aerobic Stabilization to Enhance the Value of Animal Manures on Feedstuffs.
Final rept.,
John H. Martin, Jr., Raymond C. Loehr, and Thomas E. Pilbeam. Mar 83, 65p EPA-600/2-83-024B
Grant EPA-R-806140
See also Volume 3, PB83-190298, and Volume 1, PB83-190272.
Also available in set of 3 reports PC E99, PB-83-190264.

Keywords: *Waste management, *Agricultural wastes, *Animal feeds, Aeration, Animal nutrition, Chickens, Market value, Substrates, Amino acids, Comparison, Soybeans, Food composition, Operation costs, Cost effectiveness, Livestock, Odor control, *Manures.

This investigation evaluated the potential of aerobic stabilization to increase the value of animal manures as feedstuffs. Laboratory scale batch and continuous flow studies using laying hen manure as a substrate were conducted. The batch studies conducted were for periods of 15 and 10 days. Completely, mixed continuous flow reactors were operated at retention time of 3, 5, 7, and 10 days. Results from both sets of studies indicated that the essential amino acid content and thus the potential value of laying hen manure as a feedstuff can be substantially increased with short-term aeration. Aerobically stabilized laying hen manure appears to be a well-balanced source of the essential amino acids required by White Leghorn laying hens. Such stabilized manure generally is comparable to soybean meal in essential amino acid composition. This process appears to be adequate to justify the cost of aeration for waste stabilization and odor control.

PB83-190298/GAA PC **A05**/MF **A01**
Cornell Univ., Ithaca, NY.
Resource Conservation and Utilization in Animal Waste Management. Volume III. Utilization of Animal Manures as Feedstocks for Energy Production.
Final rept.,
John H. Martin, Jr., and Raymond C. Loehr. Mar 83, 89p EPA-600/2-83-024C
Grant EPA-R-806140
See also Volume 2, PB83-190280.
Also available in set of 3 reports PC E99, PB83-190264.

Keywords: *Waste management, *Agricultural wastes, *Energy, *Renewable energy, Feasibility, Thermochemistry, Combustion, Pyrolysis, Oxidation, Poultry, Livestock, Moisture content, Economic factors, Odor control, Water quality, *Biogas.

This study critically examined the feasibility of using thermochemical processes such as combustion, pyrolysis, and partial oxidation and anaerobic digestion as methods for utilizing livestock and poultry manures as renewable sources of energy. Technical, economic, and environmental quality aspects were considered. Results of this study indicate that livestock and poultry manures can, at best, supply only a small fraction of U.S. energy requirements and cannot significantly reduce the dependence of U.S. agriculture on petroleum fuels. It also was found that the technical feasibility of manurial biogas production has been adequately demonstrated and a rational basis for system design and operation has been established. Although manurial biogas production is technically feasible, economic feasibility was found to be site specific depending on available biogas utilization options.

PB83-191288/GAA PC **A07**/MF **A01**
National Research Council, Washington, DC.
Proceedings of Panel Discussions on Science and Technology Planning and Forecasting for Indonesia: Special Emphasis on Manpower Development Held at Jakarta, Indonesia on November 8-10, 1982.
1983, 150p
Contract AID-497-79-100-23

Keywords: *Research and development, *Indonesia, *Training, *Management planning, Developing countries, Specialized training, Personnel development, Employment, Policies, Technology transfer, Resources.

Continuing economic growth of Indonesia is leading to increasing demands on science and technology. The country's future development will depend heavily on its ability to use science and technology effectively to make the best use of natural resources. This task will be undertaken by broadening the scope of human activities and raising the quality of Indonesia's human resources. One of the roles of research, science and technology is to promote value-added processes and the creation of jobs through industrial development. With the benefit of science and technology, much progress has already been made during the first three 5-year development plans. Indonesia must increase significantly its output of trained personnel and improve the quality of their training within severe constraints on time and resources. This problem can only be solved by making maximum use of existing manpower and institutional mechanisms, by creating new institutions where necessary, and by using the most suitable training technologies, both old and new. To examine these problems and needs panel discussions were held in Indonesia.

PB83-191296/GAA PC **A05**/MF **A01**
National Research Council, Washington, DC.
Coastal Resource Development and Management Needs of Developing Countries.
Final rept.
1982, 79p
Grant AID-DAN-5538-G-SS-1023

Keywords: *Management planning, *Natural resources, *Coasts, *Energy source development, *Environmental impacts, Watersheds, Erosion, Water pollution, Agricultural wastes, Reefs, Coral, Sewage, Technical assistance.

The coastal regions of the large proportion of developing countries that border on oceans and seas include many of those countries' major population centers. In fact, well over 50% of the world's people live either at the coasts or in adjacent coastal lowlands areas. Coastal lands and waters also comprise substantial quantities of the nations' agricultural, mineral and living resources, so that coastal degradation problems such as erosion, decreased water quality, and the destruction of living resources are issues of major concern. This report evaluates the types of technical assistance in the development and management of coastal resources that the United States might best provide in the context of national programs to encourage and assist international development.

PB83-191320/GAA PC **A06**/MF **A01**
Office of Technology Assessment, Washington, DC.
Automation and the Workplace: Selected Labor, Education, and Training Issues.
Technical memo.
Mar 83, 111p* OTA-TM-CIT-25
Library of Congress catalog card no. 83-600508.

Keywords: *Research and development, *Technology assessment, Automation, Robots, *Computers, Job analysis, Manpower, Employment, Forecasting, Specialized training.

The report examines the nature and development of automation technologies (such as robotics, computer-aided design and manufacturing, and automated materials handling, storage, and retrieval). The assessment also evaluates the structure and competitive conduct of industries producing and using programmable automation technologies. Finally, the implications of the production and use of programmable automation for labor and for education and training activities are examined. This Memorandum discusses procedures for evaluating potential employment change associated with automation, and outlines associated problems. It also provides descriptions of the nature and modes of delivery of education, training, and retraining for persons holding or seeking employment in manufacturing industries.

PB83-191353/GAA PC **A04**/MF **A01**
National Research Council, Washington, DC.
Proceedings of Economic Community of West African States (ECOWAS) Energy Symposium: Energy for Survival Held at Freetown, Sierra Leone (Africa) November 2-6, 1981.
Final rept.
1982, 64p
Grant AID-DAN-5538-G-SS-1023

Keywords: *Energy, *Petroleum, *West Africa, Crude oil, Balance of payments, Policies, Economic development, Economic Community of West African States, Deforestation, Energy conservation.

Severe energy problems plague the 16 member states of the Economic Community of West African States (ECOWAS), including those exporting petroleum. Two particular problems are characteristic of the region. The first is deforestation which is leading to lower agricultural productivity, climatic changes, and reduced individual productivity because of the labor and time required to collect fuelwood. The second problem is the purchase of petroleum by countries, causing negative balance of payments, which in turn diverts financial resources from the other development programs. The objectives of the ECOWAS Energy Symposium were to bring these problems to the attention of policy makers and to decide upon a course of action.

PB83-191429/GAA PC **A03**/MF **A01**
Tanzania National Scientific Research Council, Dar es Salaam.
African Goals and Aspirations in the United Nations Conference on Science and Technology for Development. Report of a Symposium Held in Arusha, Tanzania January 30-February 4, 1978
Feb 78, 50p

Keywords: *Research and development, *Africa, Policies, Meetings, Requirements, Technology, Research management.

This is a report of symposium organized as part of the activities leading to the United Nations Conference on Science and Technology for Development (UNCSTD) held in Vienna, Austria August, 1979. The participants of the symposium sought to focus on the needs and priorities of African countries in the area of the application of science and technology to development, to voice the general problems facing Africa in this regard, and to make general broad recommendations which could be used as inputs to the UNCSTD. The symposium recommended the following: (1) Formulation of integrated national science and technology policies; (2) The building-up of the appropriate infrastructure and indigeneous national capability in science and technology; (3) The establishment of a new framework of regional and international co-operation in science and technology.

PB83-191445/GAA PC **A02**/MF **A01**
Tanzania Industrial Research and Development Organization, Dar es Salaam.
Trainers' Guide on Soap Making Using Raw Materials Indigenous to Tanzania,
P. K. Haule. Nov 82, 21p

Keywords: *Tanzania, *Soaps, Substitutes, Technology, Sources, Guidelines, Consumer products, Developing country.

In Tanzania today there is an acute shortage of soap. This has been caused by a shortage of the raw materials necessary for making soap. The report gives technical description of soap, a listing of the ingredients needed for making soap and their sources in Tanzania, and a listing of the equipment needed for making soap at household or village level.

PB83-191601/GAA PC **A08**/MF **A01**
Environmental Protection Agency, Washington, DC. Criteria and Standards Div.
Benefits and Implementation Potential of Wastewater Aquaculture.
May 82, 164p*

Keywords: *Aquaculture, *Waste water, *Water pollution, Benefit cost analysis, Constraints, Design, Operations, By products, Climatology, Hydrogeology, Financing, Swamps, Land use, Government policies, Fertilizers, Economic factors, Biomass, Aquatic animals.

This study has attempted to analyze the benefits and constraints of wastewater aquaculture technology in order to provide information and recommendations that may further the development of this technology.

PB83-191692/GAA PC **A11**/MF **A01**
Institute of Technology Bandung (Indonesia). Development Technology Center.
Application of Ferrocement and Related Composite Materials in Indonesia.
Final rept.,
J. B. Manga, Amin Hayat, Maasri St. Bandaro, Harsono Wirjosumarto, and Filino Harahap. Jan 82, 237p
Sponsored in part by Agency for International Development, Washington, DC.

Keywords: *Reinforced concrete, *Cement, *Construction, Concrete construction, Structural design, Composite materials, Design criteria, Developing country application.

This report covers the adaptation and testing of ferrocement technology in Indonesia, including training, project design, site selection component design considerations, performance utilization, and socio-economic benefits. Bamboocement and Fibre-cement are also studied. The conclusions of the studies are that ferrocement technology has reached social acceptability, because there are demonstrable socio-economic benefits. These include improved sanitation and better health conditions, increased job opportunities and skills, as well as social benefits from community centers. There was also a sense of achievement in the field of technology among the local people, cooperating in the development of their area.

PB83-191700/GAA PC **A12**/MF **A01**
Chulalongkorn Univ., Bangkok (Thailand). Engineering Inst. of Research and Development.
Solar Power Plant: Study and Design,
C. Boonyubol, and P. Choonwatana. Feb 83, 258p
Portions of this document are not fully legible.

Keywords: *Solar thermal power plants, Design, Computerized simulation, Feasibility, Thailand, Computer programs, Developing countries, Economic analysis, Developing country application.

The main objective of this study is to determine the feasibility of producing electricity from solar energy in Thailand through steam generation using a heliostat, a receiver, and a thermal storage subsystem. The scope of the study covers steam generation from solar thermal energy but does not include site selection or the generation of electricity from the steam. The study included technical considerations, subsystems preliminary design, research experimental design, experimental results, economic study, and conclusions and discussion. Computer simulation is involved, and the results indicate that the simulation models are valid. Hence, design by simulation model is valid. The conclusion is that a solar thermal power plant of 100 KW sub th is technically feasible for Thailand, but not yet economically feasible.

PB83-191940/GAA PC **A04**/MF **A01**
Clemson Univ., SC. Water Resources Research Inst.
Terraced Pasture for Disposal of Dairy Yard Runoff.
Final technical completion rept.
R. O. Hegg, C. L. Barth, V. L. Quisenberry, and W. H. Livingston. Dec 82, 51p 99, W83-02741, , OWRT-A-045-SC(1)
Contracts DI-14-34-0001-0143, DI-14-34-0001-9043

Keywords: *Agricultural wastes, *Land use, *Waste disposal, Pasture, Terracing, Nitrogen, Phosphorus, Barns, Fluid infiltration, Nutrients, South Carolina, Rainfall, Feedlot wastes.

An alternative system of handling and disposing of milking barn wastewater and feedlot runoff water was evaluated for three years. This system was established on a 50-cow dairy farm in South Carolina and consisted of utilizing a pasture areas downslope from a dairy to infiltrate and filter the liquid, nutrients and solids from the milking barn and the dairy feedlot runoff water. The pasture was modified by the addition of a spreader terrace and three level terraces to distribute the runoff water. Wastewater discharged from the milking barn typically infiltrated the soil before reaching the terrace system. Several of the small rainstorms produced runoff from the dairy feedlot which was completely infiltrated by the terraced pasture. The concentration of the runoff water leaving the dairy feedlot was reduced by the time it left the terraced pasture.

PB83-192039/GAA PC **A05**/MF **A01**
National Research Council, Washington, DC.
Roles of Industry and the University in Computer Research and Development.
Final rept.
1982, 97p*
Grant NSF-MC78-228116

Keywords: *Computers, *Industrial development, *Education, Technology innovation, Research management, Grants, *Research and development.

The report recommends further steps to encourage university-industry interaction in Computer Science research and development. Possible initiatives in this direction are as follows: Increased funding for joint university-industry project; funding for sabbatical visits to or from industry, emphasizing in industry; and organization of special research grants funded jointly by NSF and industry.

PB83-192369/GAA PC **A03**/MF **A01**
Grupo de Tecnologia Apropiada, Panama City.
Traditional Technologies in Panama: Classification and Description and Alternative Energy Sources Projects - English Summary,
Samuel Bern, and Glenda de Bern. Aug 82, 49p
See also Spanish version PB83-192377. Sponsored in part by Agency for International Development, Washington, DC.

Keywords: *Panama, *Energy, Housing, Sanitation, Medicine, Natural resources, Developing countries, Requirements, Developing country application.

This exposition of traditional technologies and alternate energy sources in Panama can be used as a basis upon which to build, adapt, or evaluate improved production and management that could help fill primary needs such as food, housing, energy, health, and work. Its combination of tradition with science should result in a technology appropriate to Panama's natural and human resources. The report includes a discussion of the concept of socially appropriate technologies and the reason why it is necessary to develop them from traditional technologies. It also shows how the research project was developed, and its results in the fields of housing, environmental sanitation, traditional medicine, transformation and use of natural resources, technologies on agricultural and animal production, tools and equipment, technologies of management, and alternate sources of energy. In each case, a discussion on the expected socio-economic impact of the introduction of the improved technologies is included. A list of international organizations working with appropriate technology in Panama and a list of Latin American organizations interested in appropriate technology is also included. A strategy for the effective development of appropriate technology to be carried out in Panama is proposed.

PB83-192377/GAA PC **A10**/MF **A01**
Grupo de Tecnologia Apropiada, Panama City.
Tecnologias Tradicionales en Panama: Classificacion y Descripcion. Fuentes Alternas de Energia. Inventario de Proyectos (Traditional Technology in Panama : Classification and Description).
Samuel Bern, and Glenda de Bern. Aug 82, 211p
Text in Spanish. See also English summary, PB83-192369. Sponsored in part by Agency for International Development, Washington, DC.

Keywords: *Panama, *Energy, Housing, Sanitation, Medicine, Natural resources, Developing countries, Requirements, Developing country application.

This report is the Spanish version of report PB83-192369, which is an exposition of traditional technologies and alternate energy sources in Panama. It is offered as a basis on which to build, adopt or evaluate improved production and management.

PB83-192625/GAA PC **A03**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Productivity Measurement for the Construction Industry.
Final rept.,
Stephen F. Weber, and Barbara C. Lippiatt. Feb 83, 42p NBS-TN-1172

Keywords: *Productivity, *Construction, Input, Output, Economic analysis, Production rate, Performance, Work measurement.

The fundamental concept underlying all productivity measures is a comparison of the output of a production process, an enterprise, an industry, or an economy with the corresponding factors of production (inputs) required to generate that output. Productivity measures are formulated as a ratio of output to one or more of the inputs. This report evaluates alternative productivity measures and concludes that the comprehensive Total Factor Productivity (TFP) method is preferred to the Single Factor Productivity method. To combine the multiple components in the denominator of a TFP index, a weighting system based on relative factor cost shares is recommended. A measurable index of the instantaneous rate of change in TFP between two time periods is derived from a general production function. The report also investigates the specific data requirements for implementing this TFP measure in the construction industry. An annotated bibliography is included.

PB83-192781/GAA PC **A02**/MF **A01**
Southeastern Forest Experiment Station, Asheville, NC.
Herbicide Tests for Control of Brazilian-Pepper and Melaleuca in Florida.
Forest Service research note,
S. L. Woodall. Oct 82, 12p FSRN-SE-314

Keywords: *Brazil, *Herbicides, Concentration(Composition), Soils, Pesticides, Plants(Botany), *Weed control, Melaleuca quinquenervia, Schinus terebinthifolia, Ammonium sulfamate, Bromacil, Dicamba, Diuron, Glyphosphate, Hexazinone, Picloram, 2-4 herbicide.

Container-grown Brazilian-pepper and melaleuca seedlings, 1-1/2 and 3-1/2 months old, were treated with eight herbicides at two concentrations in greenhouse screening trials. Root-absorbed herbicides were more effective than those foliar-absorbed, and gave virtually complete control with both species. Herbicides with little residual activity were in-effective. Mature Brazilian-pepper bushes were field-tested with six herbicides and five application techniques. Basal spot treatments with Hyvar and Velpar gave good control. Stem injection of Tordon also gave good control, but was labor-intensive. Stump treatments with silvex, Banvel, and Ammate reduced resprouting from stumps to acceptable levels, but did not adequately prevent root suckers. Foliar sprays of silvex, Banvel, Ammate, and Velpar gave erratic results, and generally were unsuccessful.

PB83-192997/GAA PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Report on Testing of the Automated Fiber Counter,
Paul A. Baron, and Keith G. Crouch. 1982, 16p

Keywords: *Safety, *Environmental surveys, *Asbestos, Exposure, Toxicity, Inspection, Hazardous materials, Concentration(Composition), Industrial wastes, Mines(Excavations), *Toxic substances, *Occupational safety and health.

Asbestos dust exposure is a documented hazard, a classic example of a cause of illness originating in the industrial and mining environment. A vital aspect in the prevention of asbestos exposure is measurement of the concentration of air borne asbestos. Currently, the most widely accepted method of measuring air concentrations of asbestos is to collect a sample of air borne dust on a filter and then analyze the filter by phase contrast light microscopy. The current NIOSH recommended version of this technique is described in Physical and Chemical Analysis Method 239 (PCAM 239).

PB83-193276/GAA PC **A02**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg.
Microbiological Studies Towards Optimization of Methane from Marine Plant Biomass.
Final rept. Jul 79-Jun 82,
J. G. Ferry, and J. S. Chen. Jul 82, 21p GRI-82/0035
Contract GRI-5014-363-0178
See also PB82-214362.

Keywords: *Methane, *Biomass, Marine atmosphere, Fermentation, Degradation, Microorganisms, Ethyl alcohol, Hydrogen, Acetates, Propionates, Enzymes, *Bioconversion, Methanobacterium formicicum, Methanococcoides methylutens.

The conversion of marine biomass was studied with kelp-degrading methane-producing enrichment cultures. Mannitol and alginate are used concurrently. Hydrogen ranged from 50nM to 1.2 micrometers. The appearance of ethanol correlates with increased hydrogen. A method was developed for measurement of intermediates in the sea water medium used for the enrichments.

PB83-193425/GAA PC **A03**/MF **A01**
Georgia Dept. of Community Affairs, Atlanta.
Integrated Financial Management Decision Model for Small City and County Governments.
Research rept.,
Richard F. Wacht. Oct 82, 47p NSF/ISP-81068
Grant NSF-ISP79-08955
Prepared in cooperation with Georgia State Univ., Atlanta.

Keywords: *Financial management, Counties, Mathematical models, Forecasting, Budgeting, Planning, Municipalities, Georgia, Waycross(Georgia), Small cities, Computer applications.

The purpose of this research was to develop a fully integrated, multiperiod financial management decision model for small city and county governments, capable of being operated on a micro or mini computer by the municipality's own personnel. The model was to be designed to interface with any prepackaged budgetary-accounting systems offered by computer manufacturers or software systems firms and operate as an extension of these systems for the purpose of providing more and better types of data for financial decisions, policymaking, and long-range financial planning.

PB83-194779/GAA PC **A05**/MF **A01**
Alaska Univ., Fairbanks. Marine Advisory Program.
Financial Statements and Business Calculations for Commercial Fishermen: A Do-It-Yourself Guide,
Craig S. Wiese. Dec 82, 94p MARINE ADVISORY BULL-14, NOAA-83041807
Grant NA81AA-D-0009

Keywords: Fishing, *Financial management, Assets, Liabilities, Budgeting, Income, Expenses.

This do-it-yourself guide will aid commercial fishermen in preparing financial statements and in making business calculations. The first section helps to analyze current and past operations while the second section helps to assess the feasibility and profitability of future business plans.

PB83-195644/GAA PC **A22**/MF **A01**
Michigan Univ., Ann Arbor. Inst. of Public Policy Studies.
United States in the World Economy: Adaptations to Changes in Trade, Trade Policies, and Technology Transfer.
Final rept.,
Robert M. Stern, Alan V. Deardorff, John H. Jackson, Gary Saxonhouse, and Morris Bornstein. 12 Apr 82, 522p* NSF/PRA-82052
Grant NSF-PRA81-16287

Keywords: *Technology transfer, *International trade, Government policies, Political objectives, Economic impact, Capital, Manpower, Legal aspects.

The economic, legal, and political impacts of actual and potential trade and policy actions affecting the international flows of goods, services, labor, and capital between the U.S. and its trading partners are analyzed. The effects of the Tokyo Round on the structure of protection in the U.S. and other industrialized countries are considered and the effects of extending the Generalized System of Preferences are addressed. The relations of the U.S. with Japan, Canada, Mexico, and Soviet bloc countries are examined. Also considered are trade and investment in the automobile industry and in high technology goods and services. Details on meetings held on trade policies are included. Reviewer comments and a response from the principal investigator are appended to the report.

PB83-195651/GAA PC **A04**/MF **A01**
BioChem Technology, Inc., Malvern, PA.
Production of Cellulose Powders Using Cellulase Enzymes,
D. W. Zabriskie. Mar 82, 70p NSF/CPE-82007
Grant NSF-CPE81-14122

Keywords: *Cellulose, *Enzymes, Powder(Particles), Hydrolysis, Feasibility, Polymerization, Marketing, Technology.

A study to establish the feasibility of preparing cellulose powders employing the selective hydrolysis characteristics of cellulase enzymes is discussed. The duration of treatment, addition of inhibitors of selective cellulase activities, the source of cellulase, and the amount of cellulase, are shown to be important variables in determining the characteristics of the cellulose powder products. The technical feasibility of producing cellulose powders using cellulase enzymes is demonstrated and it is concluded that this technology may lead to a commercially attractive process. The need for an investigation of the effects of hydrolysis on the degree of polymerization is noted. Markets for cellulase powders are listed.

PB83-195669/GAA PC **A03**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Analytical Methods Applications in Safety Engineering: A Training Monograph,
James B. Walters, and Shimon Y. Nof. Oct 82, 49p
Prepared in cooperation with Purdue Univ., Lafayette, IN.

Keywords: *Safety, *Occupational safety and health, *Training, Instructional materials, Judgment, Decision making, Methodology.

In most safety engineering activities, as in most other engineering areas, the engineer has to evaluate specific situations and seek a course of action among alternatives. Typically, certain overall objectives must be achieved with limited resources and budgets. The engineer has to identify and propose feasible alternative actions; measure, evaluate, and compare these actions; and then recommend a preferred one among them. For instance, in reviewing the emergency equipment needs of a factory the engineer must decide between conflicting issues. On one hand, more equipment will improve safety levels, which is the engineer's objective, particularly if it is spread all over the factory. On the other hand, the budget is limited, and also, having too much equipment can cause confusion during an emergency. Furthermore, a lesser amount of equipment may well be sufficient is enough people are trained to use it effectively. Thus, it may be wise to divert some of the available budget toward training. The engineer must decide how much equipment to purchase and how much of the budget to divert to training. The solution to this problem may be approached by judgmental and qualitative methods, empirical methods, quantitative methods, or analytical methods.

PB83-196071/GAA PC **A03**/MF **A01**
Iowa State Univ., Ames.
Role of Foreign Investment in Developing the Agricultural Sector of the Nigerian Economy,
Modestus Okerc, and Howard E. Van Aukin. 1983, 44p

Keywords: *Economic analysis, *Agricultural economics, *Nigeria, Foreign countries, Economic factors, History, Government policies, *Land use, Grants, Loans, Credit, Food, Production, Developing country application.

This paper focuses on the requirements and constraints of foreign investment in the Nigerian agricultural sector. It compares a closed system economy with an open one, and addresses economic growth, the historical development of Nigerian agricultural policy, the mobilization drive toward self-sufficiency, food importation, Nigeria's oil dependence, government recognition of food shortage and the need for self-sufficiency, specific government programs and policies to improve agriculture, alternative policies for financing agricultural growth through credit and loan subsidies, government intervention in agriculture, the necessity of foreign investment to Nigerian agriculture, land ownership and land use policies, impacts of land purchases by foreign investors, and government control of foreign investment. The paper concludes that foreign investment would increase Nigerian food production.

PB83-196097/GAA PC **A13**/MF **A01**
American Society of Civil Engineers, New York.
Water Conservation and Reuse in Industry and Agriculture: Research Needs. Proceedings of the Environmental Engineering Research Council Workshop Held at Kiawah Island. South Carolina, March 3-6, 1982.
1982, 296p NSF/CEE-82114
Grant NSF-CEE81-04422
Sponsored in part by Construction Engineering Research Lab. (Army), Champaign, IL., American Water Works Assoc. Research Foundation, and Water Pollution Control Federation Committee on Water Reuse.

Keywords: *Waste water reuse, *Agricultural economics, Irrigation, Mining, Farms, Public health, Electric power plants, Cooling water, Municipalities, Circulation, Management, Policies, Technology assessment.

Eight papers delivered at the workshop are presented. The papers, which address water conservation and reuse from both the industrial and the agricultural perspective, cover such topics as: public health aspects of the reuse of wastewater in agriculture; reuse of water in oil shale mining; incentives and disincentives for industrial water reuse and recycling; and ways to manage water resources for optimum irrigation, power plant, and municipal water use efficiency. Attention is given to both technical and management/policy needs.

PB83-196493/GAA PC **A02**/MF **A01**
Auburn Univ., AL. Water Resources Research Inst.
Effects of Water Exchange on Water Quality in Channel Catfish Ponds.
Completion rept. 1 Feb 82-31 Mar 83,
Claude E. Boyd. 31 Mar 83, 11p W83-02897. ,
OWRT-A-083-ALA(1)
Contract DI-14-34-0001-2101

Keywords: *Water pollution, *Fishes, *Aquaculture, *Ponds, Nutrients, Removal, Losses, Phosphorus, Inorganic nitrates, Nitrites, Ammonia, Plankton, Biomass, Chlorides, Tracer studies.

Nutrient and organic matter removal from catfish ponds by water exchange or biological extraction was investigated. Separate trials were conducted to determine losses of added phosphours, nitrate, nitrite, ammonia, and chemical oxygen demand. Chloride was added to ponds as an inert tracer to estimate the efficiency of water exchange. In spring (March-April), average water temperature and plankton biomass were low (15.1C and 10 micrograms/1 chlorophyll a), and water exchange at 134 m3/hour per hectare for 72 hours removed concentrations faster than in situ biological processes. In summer average water temperature and plankton biomass were high, (29.5C and 101 micrograms/1 chlorophyll a), and biological extraction of nutrients and organic matter was equally as effective as water exchange in reducing concentrations.

PB83-196519/GAA PC **A10**/MF **A01**
Tennessee Water Resources Research Center, Knoxville.
Problems, Issues, Constraints, and Barriers to Water Quality Planning and Management in Urban and Urbanizing Areas (SMSA's) in Tennessee.
Research rept.,
George E. Bowen, Timothy R. Gangaware, and Gary Ferguson. Mar 83, 217p RR-90, W83-02899, ,
OWRT-A-0620TENN(1)
Contract DI-14-34-0001-1145

Keywords: *Water quality, *Urban planning, Questionnaires, Water treatment, Erosion, Sediments, Agriculture, Runoff, Hazardous materials, Forest land, Sludge, Flooding, Construction, Oxygen, Dissolved gases, Flood plains, Algae, Eutrophication.

Results are presented of a statewide study based on the systematic gathering of information on water quality management issues, problems, and barriers from three sources: a literature review, a questionnaire sent to experts within the state, and five case studies of '208' agencies within Tennessee. The study points out considerable variation among water basins, related to both water quality and the causes and treatment of problems. The major problems identified were: erosion and sediment, agricultural and forest runoff, sludge, flooding, construction runoff, low dissolved oxygen, flood plain development, eutrophication, algal growth and contamination from hazardous wastes.

PB83-196667/GAA PC **A04**/MF **A01**
Missouri Water Resources Research Center, Rolla.
Simplified Scheme for the Analysis of Pollutants in Groundwater and Leachates Contaminated by Hazardous Chemicals,
Stanley E. Manahan. 30 Sep 82, 58p W83-02904, ,
OWRT-A-133-MO(1)
DI-14-34-0001-2127

Keywords: *Ground water, *Water pollution, *Leaching, In situ combustion, Coal gasification, Gas chromatography, Mass spectroscopy, Separation, Chemical analysis, Organic compounds.

The overall objective of the research was the development of a solvent-based separation procedure for the fractionation of organic pollutants from a hazardous waste source in water into hydrophilic; insoluble (suspended); and organophilic acid, base, and neutral fractions. The fractions may be characterized at the simplest level by dissolved organic carbon analysis, leaving open the option for more sophisticated gas chromatographic and gas chromatographic/mass spectrometric analysis. The separation and analysis procedures have been proved on a variety of organic compounds obtained as by-products of underground coal gasification.

PB83-197012/GAA PC **A03**/MF **A01**
WSA, Inc., San Diego, CA. Safety Sciences Div.
Long Term Effects of Learned Safety Skills: Demonstration of the Effectiveness of an Industrial Lift Truck Operator Safety Training Program Utilizing a Behavior Sampling Procedure.
Final rept.,
H. Harvey Cohen, and Roger C. Jensen. 1982, 46p
Contract PHS-NIOSH-210-79-0018

Keywords: *Training, *Safety, *Occupational safety and health, Effectiveness, Behavior, Statistical analysis, Workplace layout, Fork trucks, Operators(Personnel).

The two studies described in this paper were initiated by the National Institute for Occupational Safety and Health in order to clarify knowledge concerning the value of occupational safety training and the influence of post-training management actions on the safety performance of workers engaged in a semi-skilled job. Industrial lift truck operators were selected for study because industrial lift trucks are widely used throughout industry, lift truck operations demonstrate a high risk and propensity for accidents, and the risk of injury associated with typical lift truck operations depends to a large extent on the performance of the operators, although the vehicle, workplace layout, and the task are also factors.

PB83-197566/GAA PC **A02**/MF **A01**
Bureau of Mines, Reno, NV. Reno Research Center.
Development of a Soft-Soldering System for Aluminum.
Rept. of investigations/1983,
W. L. Falke, A. Y. Lee, and L. A. Neumeier. Mar 83, 22p BUMINES-RI-8747
Library of Congress catalog card no. 83-2640.

Keywords: *Soldering, *Aluminum, Electroplating, Nickel alloys, Copper alloys, Metal coatings.

The method employs application of a thin nickel-copper-alloy coating to the substrate, which enables the tin-lead solders to wet readily and spread over the areas to be joined. The aluminum substrate is mechanically or chemically cleaned to facilitate bonding to a minute layer of zinc that is subsequently applied with an electroless zincate solution. The nickel-copper-alloy (30 to 70 pct Ni) coating is then applied electrolytically over the zinc, using immersion cell or brush-coating techniques. Development of acetate electrolytes has permitted deposition of the proper alloy coatings. The coated areas can then be readily joined with conventional tin-lead solders and fluxes. The joints so formed are ductile, strong, and relatively corrosion resistant, and exhibit strengths equivalent to those formed on copper and brass when the same solders and fluxes are used. The method has also been employed to soft-solder magnesium alloys.

PB83-199265/GAA PC **A05**/MF **A01**
National Fisheries Inst., Inc., Washington, DC.
U.S. Seafood Processing Industry: An Economic Profile for Policy and Regulatory Analysts.
Final rept. 1960-80,
David M. Dressel, Donald R. Whitaker, Teh-Wei Hu, and D. Lynne Kaltreider. Apr 83, 79p*
Grant NA81AA-D-00121
Prepared in cooperation with Pennsylvania State Univ., University Park.

Keywords: *Food processing, *Seafood, Industries, Government policies, Regulations, Fisheries, International trade, Operating costs, Marketing, Supply(Economics).

This overview is designed as a primer for understanding the intricacies of the seafood processing industry and the economic opportunities and constraints seafood processors face as small businesses. The text describes the business environment of the seafood processor from an integrated perspective by addressing the resource, and harvesting, processing, and marketing practices. Extensive statistical summaries are provided on: landings and value; industry structure by gross sales and employment; changes in the costs of doing business; production, value, and consumer demand; and the quantity and value of imports and exports of fishery products.

PB83-200691/GAA PC **A05**/MF **A01**
Transportation Research Board, Washington, DC.
Design and Upgrading of Surfacing and Other Aspects of Low-Volume Roads,
Eldon J. Yoder, D. G. Shurig, Benjamin Colucci-Rios, Ray S. Millard, and B. Frank McCullough. 1982, 97p TRB/TRR-875, ISBN-0-309-03462-0
Library of Congress catalog card no. 83-3986. Also pub. as ISSN-0361-1981.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC 20418.

Keywords: *Roads, *Construction, Aggregates, Portland cements, Rural areas, Cost analysis, Mathematical models, Structural design, Developing countries, Nebraska, Virginia, Computer applications.

The 14 papers in this report deal with the following areas: evaluation of existing aggregate roads to determine suitability for resurfacing; surfacings for low-volume roads in the third world; improved pavement management system for low-volume roads; performance of various thicknesses of PCC pavement; pavement evaluation and upgrading of low-cost roads; pavement design for a 3.5-million-pound vehicle; discussion of aggregate properties for untreated road surfaces; fabric-reinforced aggregate roads--overview; case for removing bridge or culvert rails on low-volume rural roads; cost responsibility for low-volume roads in Virginia; effect of unit-train grain shipments on rural Nebraska roads; development of a computerized technique to identify effective forest roadway networks; analyzing transportation networks for rural development; and, optimization of roadway structural design and maintenance strategies with special reference to developing countries.

PB83-201491/GAA PC **A02**/MF **A01**
North Carolina State Univ. at Raleigh. Sea Grant Coll. Program.
Evaluation of Five Types of Binders to Improve the Artificial Diet of Young American Eels 'Anguilla rostrata' Le Seuer.
Working paper,
James F. Salevan, III. Apr 83, 23p UNC/SG/83-3, NOAA-83042902
Grant NA79AA-D-00048

Keywords: *Aquaculture, *Fishes, Feeding stuffs, Vitamins, Mixtures, Japan, Taiwan, Binders(Materials), Anguilla rostrata, American eels.

The 'traditional' diet of young American eels (Anguilla rostrata) consists of fish meal, alpha cornstarch and a vitamin premix. This formulation has been used at the University of North Carolina Sea Grant Aquaculture Demonstration Project in Aurora, North Carolina, and in commercial eel farming operations in Japan and Taiwan. The main problems with this mixture are decreased profit margins due to wasted food and a general lowering of water quality.

PB83-201681/GAA PC **A03**/MF **A01**
National Fisheries Education and Research Foundation, Inc., Washington, DC.
Controlled Atmosphere as a New Technique in Fresh Fish Shelf Life Extension.
Final rept.,
R. C. Lindsay, R. H. Deibel, S. J. Goodfellow, A. R. Fain, Jr., and G. Finne. 23 Dec 82, 34p NOAA-83050413
Prepared in cooperation with Wisconsin Univ.-Madison, ABC Research Corp., Gainesville, FL, and Texas A and M Univ., College Station.

Keywords: *Fishes, *Food storage, Laboratories, Botulism, Surveys, Sampling, Toxicity, Fresh fish.

The research carried out under this grant represents the collaborative efforts of three research laboratories and the National Fisheries Education and Research Foundation. Collaboration of these groups allowed inclusion of a broad range of fish species representing the geographical components of the United States in a botulism incidence survey, and then allowed evaluation of three fish species in a detailed packaging study. Fish samples were obtained from a wide variety of commercial sources in forms that were usually encountered for distribution and sale of fresh products.

PB83-201798/GAA PC **A04**/MF **A01**
Environmental Monitoring and Support Lab.-Cincinnati, OH.
Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater,
James E. Longbottom, and James J. Lichtenberg. Jul 82, 61p EPA-600/4-82-057

Keywords: *Water pollution, Sewage, *Sewage treatment, *Industrial wastes, Chemical analysis, Gas chromatography, Mass spectroscopy, Sewage treatment effluents, Procedures.

To provide the Effluent Guidelines Division of USEPA with a means of measuring the concentration of pollutants in municipal and industrial wastewaters, the USEPA's Environmental Monitoring and Support Laboratory in Cincinnati, and the Environmental Research Laboratory in Athens, Georgia, collaborated on a research project that resulted in an analytical protocol that was successfully applied to a variety of wastewaters. The gas chromatography/mass spectrometry (GC/MS) procedures in that protocol for the measurement of organic pollutants were the forerunners of methods 624 and 625 that appear in this manual.

PB83-202218/GAA PC **A23**/MF **A01**
Alaska Univ., Fairbanks. Sea Grant Program.
Proceedings of the International Seafood Trade Conference Held at Anchorage, Alaska on September 8-12, 1982,
Brenda R. Melteff. Jan 83, 546p ASG-83-2, NOAA-83050304

Keywords: *Seafood, *International trade, Developing countries, Byproducts, *Fishes, *Marketing, Japan, Fishing grounds, Territorial seas, Prices, Fishing, Government policies, Economic models, Supply(Economics), Exports, Law enforcement, Technology transfer, Data processing, Salmon, Sea Grant program.

Contents:
Seafood markets in the Western Pacific;
European seafood markets;
Seafood markets in the Americas;
Theoretical/technical papers;
Workshop on data collection systems.

PB83-202614/GAA PC **A03**/MF **A01**
New Jersey Sea Grant Extension Service, New Brunswick.
Overview of Legal Constraints on Aquaculture,
Alex W. Wypyszinski. Jan 83, 30p* NJSG-83-107, NOAA-83050401

Keywords: *Aquaculture, *Nutrition, Economic factors, Regulations, State government, National government.

Although it is a growing industry, aquaculture production in the United States lags far behind nations such as China, Japan and the Soviet Union. While the development of aquaculture's nutritional and economic potential has also been hindered by economic and production factors, legal and regulatory constraints are commonly perceived as the most constraining influences. This study will outline the major areas of state and federal regulation affecting the aquaculture industry as well as efforts currently being made to reduce legal and regulatory constraints on aquaculture development.

PB83-203281/GAA PC **E07**/MF **E01**
Foras Forbartha Teoranta, Dublin (Ireland).
Manual on Urban Trees,
John McCullen, and Richard Webb. 1982, 146p ISBN-0-909120-66-7

Keywords: *Environmental management, *Urban planning, Design, Environmental engineering, Management, Climate, Surveys, Planting, Esthetics, Architecture, Landscape studies, Tree surgery.

There is an increasing public awareness of the value of trees, coupled with concern at the rate at which trees are being lost from Ireland's landscape. There is, however, often a lack of specialized knowledge in many local authorities regarding the most effective techniques of landscape design, tree planting and arboriculture. This manual has been written in order to provide an introduction to the subject for local authority engineers and planners who are currently responsible for trees and planning matters concerning trees.

PB83-203414/GAA PC **A08**/MF **A01**
California Univ., Davis. Water Resources Center.
Investigation of the Alternatives for Wastewater Disinfection: Economc, Social, and Technical: A Theoretical and Experimental Investigation of the Dynamics of Breakpoint Chlorination in Dispersed Flow Reactors,
Michael K. Stenstrom, and Hoa G. Tran. Apr 83, 164p W83-02926, , OWRT-A-073-CAL(1)
Prepared in cooperation with California Univ., Los Angeles. School of Engineering and Applied Science.

Keywords: *Waste treatment, *Sewage treatment, *Waste water, *Water pollution, Disinfectants, Substitutes, Reaction kinetics, Chemical reactors, Chemical reactions, Hydrolysis, Dechlorination, Water treatment, Sewage treatment, Dispersion, Water analysis, Chemical analysis, Water pollution detection, Chemical reaction mechanisms, Numerical solution.

The dynamics of breakpoint chlorination were examined in three continuous dispersed flow reactors. The reactors were comprised of 1/2, 2 and 3 inch PVC pipe, which were 730, 41, and 23 feet long, respectively. Chlorination of ammonia at various chlorine to ammonia ratios were investigated over the pH range of 6.5 to 7.5. Seventeen experiments were performed in the three reactors over the course of the experimental investigations. Chlorine residuals, including free, monochloramine, dichloramine, and nitrogen trichloride and ammonia were analyzed simultaneously. To quantitatively characterize the breakpoint reactions, a mathematical model, consisting of eight simultaneous, quasi-linear, partial differentials equations was developed. The model was solved using an implicit finite difference technique. The reaction rate coefficients were treated as parameters, and were estimated using a search technique to minimize the sum of squares of the difference between the expected and measured values. The model can now be used to simulated continuous flow chlorination processes in order to develop process operating strategies to maximize or minimize any given experimental objective.

PB83-203653/GAA PC **A04**/MF **A01**
National Research Council, Washington, DC.
Needs in Science and Technology for Development in Caribbean Island actins: Report of a Workshop held in Washington, DC., August 30-31, 1982.
Final rept.
May 83, 66p

Keywords: *Technical assistance, Meetings, Manpower, *Transportation, Resources, *Telecommunications, Aquaculture, *Agriculture, Requirements, Industries, Technology transfer, Incentives.

The nations of the Caribbean are relatively small in size and population. Most lack natural resources and are dependent on the production of a few basic commodities. The population has doubled since 1950 and will double again by the end of the century. The labor force is expanding much faster than the economics can absorb, resulting in high unemployment. Scarce public resources are diverted toward dealing with the political and social consequences of high unemployment and rate of urbanization. During the 1970's, most of the Caribbean nations were severely affected by the large increase in the price of oil and sharp drops in prices of commodities. At the same time, the U.S. recession and high interest rates increased their debt and halted growth. The problems of these nations are similar, interrelated and require some cooperation and integration of efforts to resolve. BOSTID proposed that an examination be made of some of the critical scientific and technological needs of the Caribbean nations, and that this examination take place in a workshop setting with participants from both the U.S. and Caribbean. After an initial planning meeting was held to determine the terms of reference for the workshop, the workshop took place in August, 1983. Funding was provided by the National Research Council's Program Initiation Funds. Discussions focused on how S&T could enhance the development of marine and coastal resources, agriculture and industry.

PB83-204180/GAA PC **E03**/MF **E03**
Chartered Inst. of Building, Ascot (England).
Survival or Success: Developing an Appropriate Response to a Fluctuating Demand for the Building Firm.
Occasional paper,
R. H. Barnard. 1982, 24p ISBN-0-906600-46-4, OP-25

Keywords: *Construction, *Great Britain, Economic factors, Political science, Socio-economic factors.

The demand in recent times for buildings in the UK has been cyclical and for hundreds of years the building industry has suffered from the many problems arising from this phenomenon. This paper considers the problems and effects of changing demand, the bases of such changes arising from economic, social and political factors and finally suggests the way in which firms can cope.

PB83-204974/GAA PC **A04**/MF **A01**
National Defense Univ., Washington, DC. Research Directorate.
World Grain Economy and Climate Change to the Year 2000: Implications for Policy. Report of the Final Phase of a Climate Impact Assessment,
D. Gale Johnson. 1983, 58p ARPA ORDER-3359, NOAA-83050904
Contract MDA903-77-C-0914
Library of Congress catalog card no. 83-600700. Sponsored in part by Department of Agriculture, Washington, DC., and Institute for the Future, Menlo Park, CA.

Keywords: *Grains(Food), *Environmental impacts, *Agricultural economics, Economic models, Yield, Production, Developing countries, Livestock, Mathematical models, Farm crops, Global.

During the two decades preceding 1972, the United States and several other major exporting countries had problems with costly agricultural surpluses and excess production capacity. At the same time widespread hunger continued in many of the world's poorest countries. In 1972 the world food situation began to change rapidly and moved toward relative scarcities and high prices as the surpluses in developed countries disappeared. Although it referred to some disagreements among climatologists, the Fortune article clearly gave first place to a 'grim scenario' associated with a global cooling trend seen as likely to result in southward shifts of the Sahara Desert, irregular monsoons during the rest of the century in regions such as northern India. In 1976 the Central Intelligence Agency released a study with a gloomy prognosis for climate and its impacts. The main conclusion of this study is that through the end of this century the world is very unlikely to face climate changes of such magnitude as to affect the world food situation significantly. United States food policy would have to be modified if there were a widely accepted view of imminent and highly probable major changes in world climate.

PB83-205229/GAA PC **A06**/MF **A01**
Urbitran Associates, Inc., New York.
Simplified Techniques to Estimate Emissions and Fuel Consumption Inventories (User's Manual).
Final rept.,

Edward T. Herlihy, Michael F. Odniceanu, John C. Falcocchio, Luis Sanchez, and Calvin Roberts. Sep 82, 102p
Contract DTFH61-80-C-00069

Keywords: *Air pollution, Urban areas, Forecasting, Management planning, Transportation management, Light duty vehicles.

This User's Guide describes an improved approach for estimating mobile emissions and fuel consumption using a simplified method. The procedure is designed for use by planners and transportation analysts interested in estimating emissions and fuel consumption for light-duty vehicles (LDV) traveling in urbanized areas. The procedure is based on a set of look-up tables, and estimates changes in emissions and fuel consumption using changes in the number of trips and related VMT.

PB83-205526/GAA PC **A08**/MF **A01**
Brookings Institution, Washington, DC.
Intraindustry Structure, Integration Strategies, and Petroleum Firm Performance.
Final rept.,
Harry Gerard Broadman. 6 Oct 82, 166p
Contract SBA-4877-0A-80
Prepared in cooperation with Michigan Univ., Ann Arbor.

Keywords: *Petroleum, *Management techniques, *Industrial plants, Businesses, Economic models, Government policies, Performance evaluation.

This study covers patterns of integration of firms and the competitive power which they confer. Development of an industrial organization model applicable to various industries and significant to small business is included. The hypothesis to be tested is that integrated firms have structural opportunities which nonintegrated firms do not share. Using econometric techniques, the fit of this hypothesis to the U.S. petroleum industry will be tested.

PB83-206334/GAA PC **E07**/MF **E07**
BNF Metals Technology Centre, Wantage (England).
Magnesium Diecasting: Process Variables and Fault Correction,
T. B. Hill. c1982, 88p

Keywords: *Metals, Variability, Defects, Correction.

The short manual aims firstly to give the magnesium pressure-diecaster a simple description of the vital process variables, and how best to set his machine actions to make good castings. Secondly, the manual describes typical casting defects, and signposts the actions needed to stop them happening again.

PB83-207175/GAA PC **A09**/MF **A01**
Office of International Cooperation and Development (USDA), Washington, DC. Development Project Management Center.
Acquiring and Using Microcomputers in Agricultural Development: A Manager's Guide,
Marcus D. Ingle, Noel Berge, and Marcia Teisan. Apr 83, 178p*
Sponsored in part by Agency for International Development, Washington, DC. Prepared in cooperation with Maryland Univ., College Park. International Development Management Center.

Keywords: *Computers, *Management techniques, *Agriculture, Agricultural economics, Procurement, Managers, Computer applications.

This guide is intended for development personnel who are associated with the management of agriculture and rural sector projects or institutions. It focuses on individual managers, management teams, or management-related personnel who are likely to purchase a single-user microcomputer or who already have one and are interested in expending and sustaining its use in a development organization. This guide has been written to provide host-country, donor agency, and contractor managers with relevant information about microcomputer acquisition, installation and use. This guide includes six appendices including a listing of major manufacturers, periodicals about microcomputers, a bibliography and a glossary.

PB83-207928/GAA PC **A05**/MF **A01**
Illinois State Water Survey Div., Champaign.
Illinois Solar Weather Program.
Contract rept. 1 Sep 80-31 Aug 82,
L. Keith Hendrie. Mar 83, 81p ISWS/CON-83-304, iL/ENR/DOC-83/10

Keywords: *Wind energy, *Solar energy, Networks, Instruments, Tables(Data), *Wind power.

Interest in alternative energy sources, and pressures to develop appropriate technology to utilize them, have increased with the rapid depletion of, and frequent cost increases for, environmentally-acceptable conventional fossil fuels. Solar radiation and wind energy have been widely proposed as alternatives, and have been suggested as potential buffers for the national energy crisis, at least until replacement energy resources are developed. This program was initiated to establish an observational network to provide a high quality solar radiation data base on the temporal and spatial scales critical to the appropriate evaluation of solar energy systems. A wind-energy potential component has been added to the network and will provide a statistically significant and spatially coherent data set for wind energy conversion systems.

PB83-208025/GAA PC **A13**/MF **A01**
Pittsburgh Univ., PA.
Impact of Increasing Energy Prices and Energy Supply Curtailments on Small Business in the U.S.
Final rept.,
Samuel I. Doctors, Judith B. Cohen, and Paul Y. Hammond. Sep 81, 287p
Contract SBA-2627-OA-79

Keywords: *Energy, Expenses, *Small businesses, Fuel supplies, Energy consumption.

The study addresses the impact of increasing energy costs, energy curtailments and shortages on a national sample of businesses employing less than 500 workers. The aim of the study was to created a five-sector data base developed from questionnaires administered to 6,000 small firms, through which the impact of energy problems can be evaluated and assessed by decision makers in government and in the private sector.

PB83-208876/GAA PC **A06**/MF **A01**
Massachusetts Univ., Amherst. Water Resources Research Center.
Effect of Ozonation on the Biodegradability and Adsorbability of Specific Organics to be Removed in the Biologically Activated Carbon (BAC) Process,
Francis A. DiGiano, Shelia F. Mcshane, and Michael F. Lorenzo. Dec 82, 111p PUB-135, W83-03107, , OWRT-A-132-MASS(1)
Contract DI-14-34-0001-0123

Keywords: *Water treatment, Potable water, Phenol, Benzoic acid, Nitrophenols, Industrial wastes, Biological industrial waste treatment, Benzoic acid/chloro.

Phenol, 2,4, dinitrophenol, paranitrophenol, benzoic acid and ortho-, meta- and parachlorobenzoic acid were ozonated and changes in the adsorption isotherm were measured. Gilson respirometry studies were conducted using unozonated solutions of phenol and benzoic acid in order to measure the availability of sorbed substrate for biodegradation. Similar studies with ozonated solutions examined the effect of ozonation on the biodegradability and availability of sorbed substrate. Even at low ozone dosages, the adsorption isotherm, as measured by the total organic carbon of the mixture, was in most cases different than that of the parent compound; adsorption was decreased but there were also exceptions. Competitive adsorption between the residual parent sorbate and the low concentration(s) of by-products of ozonation was suggested but not proven. Sorbed substrate was shown to be available for biodegradation. Ozonation of phenol increased oxygen uptake substantially in flasks containing activated carbon, but not in flasks containing sand. In the absence of sorbed substrate, ozonation may not necessarily lead to increased oxygen uptake if the effect of ozonation is to lower the stoichiometric amount of oxygen required for biodegradation.

PB83-209031/GAA PC **A04**/MF **A01**
Bechtel National, Inc., San Francisco, CA.
Energy Recovery from the Reject Brine of Reverse Osmosis Systems.
Final rept.,
Sherman May, Randall Soo-Hoo, David Prend, and Alfred N. Rogers. Mar 81, 64p W83-03113, , OWRT-C-90302-D-9528(1)
Contract DI-14-34-0001-9528

Keywords: *Energy source development, Design criteria, Brines, Sea water, Economic analysis, Performance evaluation, *Desalination.

A novel power recovery system, immiscible fluid energy recovery device (IFERD), for reverse osmosis desalting plants was investigated. Conceptual designs and cost estimates were developed for two commercial-sized seawater reverse osmosis desalting plant applications. An economic evaluation of the IFERD system when compared to conventional power recovery devices shows the IFERD system to be more economically attractive in most cases, except when power costs are extremely low. This is mainly due to its superior efficiency in both the recovery of energy and the application of the recovered energy. In addition, the IFERD system offers potentially increased reliability and reduced maintenance. Recommendations are made for pilot testing to demonstrate the performance and reliability of the IFERD system and to obtain other data necessary to develop the IFERD system to the point of commercial use.

PB83-209239/GAA PC **A06**/MF **A01**
Puerto Rico Univ., Mayaguez. Water Resources Research Inst.
Organizational Approach to Water Resources in Puerto Rico,
Gerardo Cumpiano, Pedro Cantero, Ernesto Mayoral, Humberto Ramirez, and Francisco Vilella. 1978, 118p
Grant NSF-SPI78-03489

Keywords: *Water pollution, *Water supply, *Puerto Rico, Project planning, Legislation, Economic impact, National government, Developing country application.

This study identifies possible administrative problem areas in supplying water to Puerto Rico. It covers water resource coordination in the Federal Government, planning coordination in the Commonwealth, water resource planning in the commonwealth, coordinating functions of DNR, legislative arrangements, general and specific responsibility areas, agencies with multiple responsibilities, interdepartmental and interagency cooperation, regulatory agencies, and an economic and legal area report.

PB83-209247/GAA PC **A04**/MF **A01**
Center for Energy and Environment Research, Caparra Heights, PR.
Assessment of Solar Energy as an Alternative Energy Source for the Republic of Panama,
G. T. Pytlinski, and K. G. Soderstrom. Sep 82, 61p CEER-S-141
Sponsored in part by the Department of Energy, Washington, DC.

Keywords: *Technology assessment, *Solar energy, *Panama, Assessments, Substitutes, Solar thermal power plants, Solar water heating, Photovaltaic power plants, Energy sources, Developing country application.

The report covers the Panamanian solar energy assessment program; the solar energy resource base in Panama; the scenario of solar energy implementation; solar technology options including solar thermal power systems, photovoltaic systems (utility interface), and solar water heating systems (economics of solar water heating, market penetration, manpower training, and institutional and social considerations); expected impact of solar technologies; and conclusions. The basic conclusion is that all the plants visited in the study could make effective use of solar energy, reducing the use of fossil fuels. There was also plenty of opportunity for private use of solar energy.

PB83-209585/GAA PC **A02**/MF **A01**
Center for Energy and Environment Research, Caparra Heights, PR.
Solar Ponds: Research, Applications and Development,
G. T. Pytlinski. Dec 82, 23p CEER-S-151
Sponsored in part by the Department of Energy, Washington, DC.

Keywords: *Research and development, *Electric power, *Energy source development, Brines, Electric power generation, Technology, Inorganic salts, Sodium chloride, Equipment, Magnesium chlorides, Borax, Sodium phosphates, Design criteria, Performance evaluation, *Solar ponds, Developing country application.

This report briefly describes selected research in solar brine ponds, chiefly in the United States and Israel. It concludes that solar ponds are technically feasible and can be economically competitive. Salts used may be sodium-chloride, magnesium-chloride, borax, disodium phosphate, or sodium sulphate. PVC pipes and heavy duty plastic liners are used to prevent corrosion, but leak detection is difficult. Stainless steel instruments are used. Shallow solar ponds are market ready, but salt gradient solar ponds are still on the fringe of market readiness.

PB83-209593/GAA PC **A03**/MF **A01**
Center for Energy and Environment Research, Caparra Heights, PR.
Patterns of Temporal Distribution in the Metazoan Parasitology of the White Mullet, 'Mugil curema' in Joyuda Lagoon,
Jorge R. Garcia Sais. 1981, 32p CEER-M-152
Sponsored in part by the Department of Energy, Washington, DC.

Keywords: *Animal diseases, *Fishes, *Migration, Animal migrations, Sampling, Oxygen, Dissolved gases, Salinity, Temperature, Parasites, Aquaculture, Coasts, Norway, Ecology, Developing country application, White mullet, Spawning.

This study was made to learn the temporal distribution and intensity of infection by metazoan parasites in the white mullet in Joyoda Lagoon, to examine the influence that changes in the external environment have on the parasitic fauna of the white mullet, to determine the effect that spawning and possible migrations of the fish have on its parasitic composition, to add some ecological and biological information about the white mullet, and to evaluate the role of Joyuda Lagoon in the life cycle of the white mullet. Monthly samples were examined from February 1979 through April 1980.

PB83-209668/GAA PC **A04**/MF **A01**
American Embassy, Ankara (Turkey).
Horizons for Sales of Agricultural Equipment, Services and Technology to Turkey,
Ertugrul Y. Gur. Jan 83, 69p

Keywords: *Agricultural machinery, *Turkey, Developing countries, Equipment, Technology, Services, Agricultural engineering, Agricultural products, Government policies, Developing country application.

This study has been prepared to bring to the attention of American business the commercial and investment opportunities in agriculture and agro-industry which exist in Turkey. A number of projects and project proposals which need foreign technology in the form of capital investment and licensing agreements are presented, including pertinent data which will help evaluate these opportunities better. Opportunities exist in plant protection, reduction of fallow land, second crop production, livestock and poultry development, fresh fruit and vegetable development, integrated rural development, animal health, and others. Capital investment and licensing opportunities exist in livestock and poultry breeding, meat and dairy processing, oilseed storage and processing, citrus processing and packaging, pulse processing and packaging, animal feed production, plant breeding, and cold storage and crop production. There are also opportunities in research and project consultancy services, mostly connected with large-scale integrated government projects. The Turkish government encourages foreign investment.

PB83-210112/GAA PC **A04**/MF **A01**
Instituto do Acucar e do Alcool, Piracicaba (Brazil).
Planalsucar Annual Report 1980: National Program for Sugarcane Improvement.
Annual rept.,
Marco Antonio Rosa. c1981, 60p
Color illustrations reproduced in black and white.

Keywords: *Sugarcane, *Brazil, Improvement, Breeding, *Pest control, Soil fertility, Irrigation, Plant physiology, Education, Weed control, Developing country application.

This annual report covers the following subjects: Planning and Evaluation; Breeding and Selection; Entomology; Soil and Fertility; Irrigation and Climatology; Physiology and Weed Science; Agricultural Operations; Industrial Area; Technology Transfer; Information Center; Professional Training; Communication; Qualification of Research Workers; and a Publication List.

PB83-210120/GAA PC **A10**/MF **A01**
Fondo Colombiano de Investigaciones Cientificas y Proyectos Especiales, Bogota.
Elementos Procedimentales para Estructurar Unidades y Sistemas de Informacion (Procedural Elements for Structuring Units and Systems of Information),
Arley Agudelo Clavijo. 1981, 224p
Text in Spanish. Sponsored in part by Organization of American States, Washington, DC.

Keywords: *Information services, *Information sources, Index terms, *Information systems, Library science, Information sciences, Developing country application.

This report provides an introductory knowledge of information science, useful in the organization, administration, and manipulation of units and systems of information to determine, locate, select, acquire, analyze, transform, and disseminate specialized information. It explains the administrative principles for the operation of an information unit, types of scientific reports, cataloguing, references, indexing design, elements for design and planning of information systems, norms for converting descriptions into abstracts, and model questionnaires.

PB83-210138/GAA PC **A14**/MF **A01**
Centro Nacional de Informacion y Documentacion Cientifica, Madrid (Spain).
Conferencia Iberoamericana sobre Informacion y Documentacion Cientifica y Tecnologica (Iberoamerican Conference on Scientific and Tecnolgical Information and Documentation),
J. Arias Ordonez, J. I. Cuesta, M. Lopez-Muniz Goni, D. Turuguet Mayol, and R. Rodriquez Delgado. 1979, 307p
Text in Spanish.

Keywords: *Information systems, *Latin America, Motivations, Foreign countries, Requirements, Documentation, International relations, Developing country application.

This report examines the development of documentation and information during the last two decades in Latin American countries, with special emphasis on those that have originated and contributed to the support of national information systems. Based on the results of a survey and on available documentation, concrete recommendations for mechanisms and activities that have succeeded in motivating the countries of the region in the field of documentation and information are made and analyzed. In light of the present situation and the new international economic order, a proposal is presented for seven specific studies to find a solution to the most felt national and regional needs through national and international technical coparticipation.

PB83-211003/GAA PC **A09**/MF **A01**
Michigan Univ., Ann Arbor.
Summary of Thermal Properties for Casting Alloys and Mold Materials,
R. D. Pehlke, A. Jeyarajan, and H. Wada. Dec 82, 177p NSF/MEA-82028
Grant NSF-DAR78-26171

Keywords: *Castings, Thermal conductivity, Specific heat, Density(Mass/Volume), Steels, Cast iron, Data, Copper alloys, Nickel alloys, Aluminum alloys, Magnesium alloys.

A review of thermal properties of casting alloys and mold materials has been conducted for the purpose of stimulating activity in computer aided design for castings. A summary of thermal data; thermal conductivity, specific heat, density, and heats of fusion has been prepared for metals and casting alloys, and for primary molding materials. This summary represents an initial step in the development of data bases for support of computer aided design systems for castings. Additional information is required, in particular for thermal properties of commercial casting alloy systems.

PB83-211193/GAA PC **A03**/MF **A01**
Puerto Rico Univ., Mayaguez.
Multivariate Statistical Analysis of Highway Conditions and Highway Accidents,
Felipe Luyanda, and Robert W. Smith. 10 Jun 82, 31p 9
Pan American Congress on Civil Engineering (1st) Held at San Juan, Puerto Rico, August 1-7, 1982.

Keywords: *Pavements, *Roads, *Motor vehicles, Statistical analysis, Rural areas, Intersections.

The research effort consists of a multivariate statistical analysis of highway conditions and highway accident data. Its main goal is to provide a means through which transportation agencies can develop realistic highway safety improvement priorities. The project consists of three main phases: (1) the elaboration of multivariate statistical models for determining the relation between highway accidents and highway conditions on rural highway links and intersections, (2) review and evaluation of multivariate statistical techniques to assess their suitability for analyzing highway accident data, and (3) utilization of an independent data set to verify and validate the models developed.

PB83-211201/GAA PC **A02**/MF **A01**
Puerto Rico Univ., Mayaguez.
Microcomputers: A Tool for Planning and Scheduling Construction Projects,
Jose F. Lluch Garcia. Aug 82, 24p 8
Pan American Congress on Economic and Cost Engineering (5th) Held at San Juan, Puerto Rico, August 1-7, 1982.Portions of this document are not fully legible.

Keywords: *Construction, *Computers, *Management planning, Critical path method, Management planning, Scheduling, CYCLONE systems, TRS-80 computers, Commodore computers, Developing country application.

The availability of low cost microcomputers, which are small in size and large in computing capacity, make computer based techniques for planning, scheduling, and control of construction projects accessible to construction contractors. A prototype microcomputer implementation of CPM (Critical Path Method) and a full CYCLONE (Cyclic Operations Network) are presented. The CPM implementation is based on precedence networks. It supports many features of CPM programs found in large computers. CYCLONE is a method for the analysis of construction operations. It focuses on how, rather than when, to carry out a construction operation. The CPM and CYCLONE systems discussed are implemented on the TRS-80 and Commodore microcomputers. They provide a cost effective alternative to construction decision makers for planning, scheduling, and control of construction projects.

PB83-211219/GAA PC **A02**/MF **A01**
Puerto Rico Univ., Mayaguez.
Bamboo as a Renewable Energy Source,
Alberto E. Molini, and Jose G. Irizarry. Aug 82, 21p 12
Pan American Congress on Energy (1st), and National Conference on Renewable Energy Technologies (2nd) Held at San Juan, Puerto Rico, August 1-7, 1982.

Keywords: *Biomass, *Fuels, Sources, Developing county application.

Our complete dependence upon imported fossil fuels forces us to make a conscientious evaluation of the other energy sources the authors have readily available. Some of the approximately 1000 species of bamboo of some 50 genera, which range from plants the size of field grass to giants 120 ft. high and one ft. in diameter, and which grow from sea level in the tropics to 10,000 ft. mountain slopes, appear to be excellent alternate renewable energy sources. This paper presents the results obtained from a recently initiated research effort on the subject.

PB83-211227/GAA PC **A02**/MF **A01**
Puerto Rico Univ., Mayaguez.

Recovery of Enthalpy as Work from Thermal Effluents,
Alberto E. Molini. Aug 82, 20p 11
Pan American Congress on Energy (1st), and National Conference on Renewable Energy Technologies (2nd) Held at San Juan, Puerto Rico, August 1-7, 1982.

Keywords: *Electric power, *Air pollution, Thermodynamics, Scrubbing, Electric power plants, Feasibility, Particles, Developing county application.

Enthalpy is recovered as work from hot industrial effluents by the controlled expansion of liquids through convergent-divergent nozzles in true reaction turbines. For hot liquid effluents, the effluent itself serves as the working fluid. For gaseous effluents, a high boiling stable liquid is heated by the gas in a scrubbing tower and then the liquid is expanded as the work fluid. If the effluents contain undesirable levels of particulate pollutants, the liquid is cleaned before it is expanded. This paper reports the results predicted when using both impulse and true reaction turbines. Results predicted when using work fluids as glycerol, tricresyl phosphate, bi-phenyls, and silicone oils are presented. Cycle efficiencies as high as 26% are predicted as possible. Recoveries as high as 30MW seem possible when using the approach as a bottoming cycle for a 460 MW steam-electric utility discharging flue gases at 500F.

PB83-211268/GAA PC **A02**/MF **A01**
Puerto Rico Univ., Mayaguez.
Work from Steam Expanded to Low Quality Levels,
Alberto E. Molini. Aug 82, 19p 10
Pan American Congress on Energy (1st), and National Conference on Renewable Energy Technologies (2nd) Held at San Juan, Puerto Rico, August 1-7, 1982.

Keywords: *Turbines, *Engines, Steam engines, Steam turbines, Heat sinks, Condensates, Superheating, Working fluids, Developing country application.

To improve the efficiency of steam engines, designers resorted to larger temperature differences between the heat source and the heat sink. A high temperature of approximately 1100 F, limited by the materials of construction, was soon reached. The heat sink is limited by the environment and mechanically to a large extent by the moisture level to which the work-fluid is expanded. Because of the close dimensional tolerances together with the inability to simultaneously remove the condensate, modern steam turbines are restricted to expansion cycles from super-heat to steam qualities of approximately 95%. Large losses of efficiency are experienced when expanding to lower steam qualities. Thus the development of modern reheat cycles which use multiple super-heats and turbines which result in cycle efficiencies of approximately 38%, and in more expensive installations. True reaction turbines overcome these limitations. This paper presents the effect of extending the expansion of super-heated steam beyond the saturated vapor line down to steam qualities of approximately 70% using true reaction turbines to obtain more economical cycles as efficient as reheat cycles.

PB83-211409/GAA PC **A03**/MF **A01**
Puerto Rico Univ., Mayaguez
Impact of Heavy Trucks on Highways and Pavement Rehabilitation Needs in Puerto Rico. (Maintenance),
Poduru M. Gandhi, and Antonio Santiago Vazquez.
Aug 82, 30p 5
Prepared in cooperation with Engineering Management and Information Systems Inc., San Juan, PR. Pan American Congress on Civil Engineering (1st) Held at San Juan, Puerto Rico, August 1-7, 1982.

Keywords: *Pavements, *Maintenance, Trucks, Flexible pavements, Concrete pavements, Puerto Rico, Pavement overlays.

This paper summarizes the results of an investigation of the highway system in Puerto Rico and points out the need for sensible regulations to control loads and a simultaneous initiation of a crash rehabilitation program to bring the pavements to the proper condition. The investigation included a systematic evaluation of the condition of representative flexible and rigid pavement sections on the primary and secondary highways in Puerto Rico.

PB83-211417/GAA PC **A03**/MF **A01**
Puerto Rico Univ., Mayaguez.

Feasibility Analysis of a Distillation Column with Vapor Recompression,
Edgar Hernandez Patino. Aug 82, 28p 7
Pan American Congress on Energy Alternatives (1st) Held at San Juan, Puerto Rico, August 1-7, 1982.

Keywords: *Distilleries, *Economic analysis, Feasibility, Thermodynamics, Economic analysis, Energy conservation, Developing county application.

This paper describes the thermodynamic and economic feasibility of a distillation column with recompression of the overhead vapor for generating heat to the reboiler. A considerable amount of energy is saved by implementing this system. A steady state model was developed to study the effect of different column variables on the feasibility of the heat pump system. A relationship between the savings and the thermodynamic availability of the mixture was devised. The savings were found to be very sensitive to the relative cost of steam and electricity. A possible way of predicting the pressure effect on the heat pump based on the Antoine equation for the vapor pressure of the key components was also devised. Vapor recompression is a feasible way of economizing energy on a distillation unit. The outlook for the use of the heat pump concept has now induced process engineers to consider its applications.

PB83-211896/GAA PC **A03**/MF **A01**
WED Enterprises, Glendale, CA.
Water Hyacinth Wastewater Treatment System.
Final rept. 1 Dec 80-1 Dec 82,
Benedict R. Schwegler, Jr. Feb 83, 48p GRI-80/0169
Contract GRI-5080-323-0396

Keywords: *Water hyacinth, *Aquatic plants, *Sewage treatment, Solar radiation, Prototypes, *Waste water, Biochemical oxygen demand, Seasonal variations, Phosphorus, Nitrogen, Adsorption, Nitrobacter, Biomass, Ammonification, Biological productivity, Anaerobic processes, Digestion(Biology), Methane, Nitrification, Harvesting, Denitrification, Primary treatment, Secondary treatment.

A prototype water hyacinth wastewater treatment system has been in operation for two years at Walt Disney World, near Orlando, Florida. Typically, the hyacinth system removes 80-90% total suspended solids and B.O.D. from the influent stream. Major impacts on water quality exiting the system are: seasonal variations insolar radiation, air and water temperature, operational problems, particularly harvesting equipment breakdown, and retention time in the ponds. Phosphorus and Nitrogen removal show a strong seasonal dependence. Nitrogen removal rates show a strong dependence on retention times, with a retention time of 5 days appearing to be a critical limit for the establishment of an active population of denitrifying bacteria. Hyacinth biomassproductivity of the system was approximately 66.7 dry metric tons per hectare year(30 dry tons/acre year) during the second year of operation.

PB83-212480/GAA PC **A12**/MF **A01**
National Science Foundation, Washington, DC.
Summary of Active Awards and Completed Projects of the Division of Policy Research and Analysis. Supplement 1.
Dec 79, 258p NSF/RA-790787
See also PB83-212472.
Also available in set of 3 reports PC E99, PB83-212464.

Keywords: *Research and development, Government policies, Technology innovation, *Technology assessment, Economic impact, Social effect, Indexes(Documentation), Risk analysis.

This document comprises three sections: project summaries, indexes, and a publications list. The project summaries are divided into five categories: (1) Environment, Energy, and Resources Studies, including energy research and development, environmental policy, energy facilities, water quality, and resources; (2) Innovation Processes and Their Management, including private sector innovation processes and technology transfer processes involving developing countries; (3) Socioeconomic Effects of Science and Technology (S&T) including the effects of S&T on individuals and on social institutions; (4) Technology Assessment and Risk Analysis, which includes technology assessment methodology and substantive technology assessment; and (5) Science, Technology, and Public Policy. Projects are indexed by institution, by principal investigator/author, and by subject/keyword.

PB83-213025/GAA PC **A12**/MF **A01**
World Health Organization, Copenhagen (Denmark). Regional Office for Europe.
Health Aspects of Chemical Safety. Planning Emergency Response Systems for Chemical Accidents. Interim Document 1. Emergency Response to Chemical Accidents,
P. H. Jones, A. Gilad, R. Chrst, D. Liverman, and E. Mitran. 1981, 262p
See also report number 4, PB83-213058. Sponsored in part by United Nations Development Programme.

Keywords: *Chemical industry, *Health, *Managment planning. *Safety, Risk, Chlorine, Management planning, Cargo transportation, Environmental surveys, *Toxic substances, Dibenzodioxin/tetrachloro, Dioxin, Developing country application.

An emergency response system for chemical accidents is designed to reduce the impact of an accident by rapid containment. It is necessary to know the nature of the chemicals; how to deal with them; the toxic, physical, and chemical properties of the materials; and the level of risk involved in contact, both for the emergency crews and the adjacent population. To prepare this report, two background studies were made: 1) Organizational model of a countrywide emergency response system for chemical accidents; and 2) survey of existing system components in European countries. Two case studies were also submitted: The release of 2, 3, 7, 8-tetrachlorodibenzo-p-dioxin (TCDD) at Seveso, Italy; and the release of chlorine in Mississauga, Ontario, Canada. The studies recommended the publishing of guidelines which are contained in section 1 of this document. Section 2 contains the result of the survey of existing procedures and arrangements for dealing with emergencies and accidents involving toxic or potentially toxic chemicals. Section 3 contains the two case studies mentioned.

PB83-213033/GAA PC **A06**/MF **A01**
World Health Organization, Copenhagen (Denmark). Regional Office for Europe.
Health Aspects of Chemical Safety. Interim Document 2. Manpower Development for Control of Chemicals,
J. H. Duffus, A. Gilad, A. I. Bainova, J. H. F. Smith, and F. A. Fairweather. 1981, 120p
See also report number 1, PB83-213025. Sponsored in part by United Nations Development Programme.

Keywords: *Chemical industry, *Health, *Environmental surveys, Toxicity, Toxicology, *Safety, *Toxic substances, Developing country applications.

Safeguarding human health and environment against deleterious effects of potentially toxic chemicals requires extensive testing and evaluation of the toxicity of chemicals as well as adequate control mechanisms. These indispensible activities are at present hampered by lack of personnel adequately trained to perform the multitude of tasks involved in the evaluation and control of chemicals. Since an awareness of the need for evaluation and control emerged very recently, there is little precedent and experience in developing professional and auxiliary personnel needed for the job. This problem requires a strategy for manpower development, including occupational profiles, training curricula, forecast of demand, and consultation on manpower development in toxic chemicals control.

PB83-213041/GAA PC **A05**/MF **A01**
World Health Organization, Copenhagen (Denmark). Regional Office for Europe.
Health Aspects of Chemical Safety. Interim Document 3. Progress Report July 1981,
A. Gilad, and S. Tarkowski. Jul 81, 87p
See also report number 2, PB83-213033. Sponsored in part by United Nations Development Programme.

Keywords: *Health planning, *Chemical industry, *Environmental surveys, *Safety, Manpower, Management planning, Risk, Regulations, *Toxic substances, Developing country application.

This Progress report of the World Health Organization covers the following topics: Program Planning and Priorities; Manpower Development and Training; Contingency Planning for Accidents and Emergencies Involving the Release of Toxic Chemicals; Monitoring and Epidemiological Studies for Chemical Control; Toxic Wastes Management; Conclusions and Recommendations of Working Group on Occupational Profiles in Toxic Chemicals Control, Brussels, 15-19 December, 1980; Recommendations of the Working Group on Contingency Planning for, and Response to, Emergencies and Accidents involving Potentially Toxic Chemicals, Bilthoven, Netherlands, 9-13 February, 1981.

PB83-213058/GAA PC **A05**/MF **A01**
World Health Organization, Copenhagen (Denmark). Regional Office for Europe.
Health Aspects of Chemical Safety. Quality Control in the Occupational Toxicology Laboratory. Interim Document 4. Laboratory Quality Control,
A. Aitio, M. H. Draper, J. Hanke, and N. Saris. 1981, 86p
See also report number 3, PB83-213041. Sponsored in part by United Nations Development Programme.

Keywords: *Chemical industry, *Health planning, *Safety, *Environmental surveys, Safety, Exposure, Risk, Assessments, Toxicology, *Toxic substances, Occupational safety and health, Developing country application.

The increasing volume and variety of chemicals produced and traded throughout the world and an increasing awareness that chemicals have the potential to adversely affect human health and the environment have prompted national and international legislation requiring the testing of chemicals for possible health effects. At the same time, the crucial importance of studying populations exposed to various chemicals in industrial settings, domestic situations, and in the general environment has been emphasized, with the need for international collaboration in these studies recognized. In both the testing of individual chemical substances for the toxic properties and in the conducting of monitoring and epidemiological studies, the need exists both to harmonized methods and to agree on measurest to ensure the validity and integrity of any data used for the risk assessment of chemicals to human health and the environment.

PB83-213645/GAA PC **A07**/MF **A01**
National Science Foundation, Washington, DC.
Workshop on the Role of Basic Research in Science and Technology: Case Studies in Energy R and D (Research and Development). Proceedings of a Workshop Held at Washington, DC, March 12-13, 1983.
1983, 141p NSF-83-30, NSF/PRA-83012

Keywords: *Research and development, *Energy, Government policies, Research projects, Technology innovation, Industries, Regulations.

Proceedings are presented from the workshop on basic research for the advancement of energy technology and science. Meanings of the term 'basic research' are provided and a common definition is sought. The direct impact of basic research on the advancement of energy technology and science and the indirect benefits of that research to society in general are evaluated. Research programs at the Department of Energy and in private industry are examined. Characteristics of industries involved in research and development (R&D) are discussed. These industries are said to be large, diversified, multinational corporations that are highly affected by government regulation and that carry on their R&D in diversified locations. Industry and university interactions are discussed.

PB83-213652/GAA PC **A08**/MF **A01**
New Alchemy Inst., East Falmouth, MA.
Solar Aquaculture: Perspectives in Renewable, Resource-Based Fish Production.
1983, 158p NSF/CEE-83026
Grant NSF-ISP80-16577
Results for a workshop at Falmouth, MA. on September 28, 1981.

Keywords: *Solar energy, *Aquaculture, Aquatic biology, Ponds, *Fishes, Hydroponics, Algae, Carp, Bacteria, Chemical reactions, Dynamics, Comuterized simulation, Mathematical models, Design, Photosynthesis, Heat exchangers, Oxygen, Growth, Trout, Seasonal variations, Blue tilapia.

A workshop conducted to review research in solar aquaculture performed at the New Alchemy Institute is described, and the development and synthesis of solar aquaculture at the Institute is discussed. The physical system of the ponds is explained, and attention is directed to the most successful fish species grown with the solar algae ponds, the blue tilapia, or Sarotheradon aureus. It is noted that algal populations could not be maintained beyond a certain temporal limit because solar pond activity beyond that limit is characterized by bacterial dominance and chemical transformations. The data collection effort is summarized and a computer simulation model of pond dynamics is provided.

PB83-213991/GAA PC **A03**/MF **A01**
National Bureau of Economic Research, Inc., Cambridge, MA.
Expectations, Financial Structure and Compositional Change in R and D (Research and Development) as Determinants of Productivity Growth.
Final rept.,
M. Ishaq Nadiri, Mark Schankerman, Jeffrey Bernstein, Ingmar Prucha, and Edward Wolff. Mar 83, 31p* NSF/PRA-83011
Grant NSF-PRA77-27048
See also PB83-214007.

Keywords: *Productivity, *Economic development, Prices, Production, Financial management, Expectation, *Research and development, Organizational structure, Industrial structure.

Fourteen papers on the following topics are summarized: (1) the role of demand expectations in determining investment decisions in research and development (R&D); (2) the effect of the financial structure of firms on their ability to invest in R&D; and (3) the effect of changes in the level and composition of R&D expenditures on the growth of productivity at the firm and industry level.

PB83-214007/GAA PC **A22**/MF **A01**
National Bureau of Economic Research, Inc., Cambridge, MA.
Expectations, Financial Structure and Compositional Change in R and D (Research and Development) as Determinants of Productivity Growth.
Final rept.,
M. Ishaq Nadiri, Mark Schankerman, Jeffrey Bernstein, Ingmar Prucha, and Edward Wolff. Mar 83, 507p* NSF/PRA-83010
Grant NSF-PRA77-27048
See also PB83-213991.

Keywords: *Productivity, *Economic development, Prices, Production, Financial management, Expectation, *Research and development, Organizational structure, Industrial struture.

Fourteen papers are presented on the following topics: (1) the role of demand expectations in determining investment decisions in research and development (R&D); (2) the effect of the financial structure of firms on their ability to invest in R&D; and (3) the effect of changes in the level and composition of R&D expenditures on the growth of productivity at the firm and industry level.

PB83-214213/GAA PC **A03**/MF **A01**
Agricultural Research Service, Beltsville, MD.
Saline-Seep Diagnosis, Control, and Reclamation.
Final rept.,
P. L. Brown, A. D. Halvorson, F. H. Siddoway, H. F. Maryland, and R. M. Miller. May 83, 27p USDA/ARS-CRR-30

Keywords: *Water pollution, *Arid land, *Farming, Precipitation(Meteorology), Water table, Slope, Range grasses, Grain crops, Soil surveys, Drainage, Monitoring, Drilling, Shales, Diagrams, Land reclamation, Great Plains Region(United States), Discharge(Water).

This publication summarizes 10 years of research and experience on saline seep problems. Saline seep is a major problem in the Great Plains area of the United States. It has resulted from changes in land use in this area from native rangeland to dryland grain production, modern farming technology, and periods of high precipitation. Saline seep is a term to describe saline water discharge at the soil surface downslope from recharge areas under dryland conditions. It affects crop growth because of greater concentration of soluble salt in the plant root zone.

PB83-214320/GAA PC **A06**/MF **A01**
United Nations Centre for Human Settlements, Nairobi (Kenya).
Land for Housing the Poor.
1983, 102p ISBN-91-540-3905-3, HS/CONF/83/5
Also pub. as Swedish Council for Building Research, Stockholm rept. no. D5:1983. Seminar held at Taellberg, and Stockholm, March 14-19, 1983.

Keywords: *Land use, *Housing, Developing countries, Policies, Poverty groups.

Efforts were concentrated on examining how governments can speed up and increase the supply of land for housing the poor, and ensure that the poor receive secure tenure for their housing. The Seminar recommends that governments concentrate on acquisition (temporary or permanent) or mobilization of land supplies, provision of basic services and delivery of land, rather than on the building of shelter structures. It was strongly felt that this was the only practical course in most developing countries where governmental resources have to be concentrated on the most effective efforts to be made. Under a framework of four topic headings, a total of 30 recommendations was approved and is presented in this report. Each recommendation represents a specific step which can be taken by governments towards meeting the land needs of the poor.

PB83-214353/GAA PC **A02**/MF **A01**
Bureau of Mines, Rolla, MO. Rolla Research Center.
Recovery of Chromium from Surface-Finishing Wastes.
Rept. of investigations/1983,
H. O. McDonald, and L. C. George. Apr 83, 15p BUMINES-RI-8760

Keywords: *Metals, Separation.

The Bureau of Mines has demonstrated a hydrometallurgical method to separate chromium from other metals in a variety of surface-finishing wastes by precipitation with benzoate ion. The resulting chromium salt may then be converted to the hydroxide, and the benzoate may be recycled. Chromium recoveries of 92 to 100 pct are obtained.

PB83-214403/GAA PC **A02**/MF **A01**
Bureau of Mines, Avondale, MD. Avondale Research Center.
Economic Evaluation of a Method to Regenerate Waste Chromic Acid-Sulfuric Acid Etchants.
Information circular/1983,
Deborah A. Spotts. Apr 83, 15p BUMINES-IC-8931

Keywords: *Economic analysis, Capitalized costs, Operating costs, Surface finishing, Electrolytic cells, Chemical reactions, *Waste recycling, Liquid wastes.

Researchers at the Bureau of Mines have developed a technique for regenerating chromic acid-sulfuric acid etching solutions used in metal surface treatment operations. The technique utilizes a diaphragm cell equipped with a cation-selective membrane to oxidize Cr(+3) to Cr(+6) at the anode and to remove copper, the major metallic contaminant, at the cathode. Normally, spent etchant is discarded after approximately 3 days of use. Using the electrolytic cell, the etchant can be used for a year without replacement. Because the magnitude of these cost savings will vary at different locations, several graphs are presented to aid in calculating payback for a specific site. Using these graphs and the capital costs presented in this study, the payback period can be determined for installing a regeneration cell with a 500- or a 1,000-gal catholyte-holding tank in an existing surface treatment plant.

PB83-214833/GAA PC **A02**/MF **A01**
Bureau of Mines, Albany, OR. Albany Research Center.
Aluminum from Domestic Clay via a Chloride Process. The State-of-the-Art.
Information circular/1983,
A. Landsberg. Apr 83, 22p BUMINES-IC-8923

Keywords: *Aluminum, *Metals, Clay minerals, Metallurgy, Chlorination.

Kaolinitic clays are potentially a vast domestic resource for aluminum. Utilization of this resource could decrease or eliminate the nearly complete dependence of the United States on foreign raw materials for this important metal. Furthermore, processing of clay to aluminum through anhydrous chloride metallurgy could reduce the high electrical energy requirements of the conventional Hall-Heroult aluminum reduction process.

PB83-215558/GAA PC **A14**/MF **A01**
Centro Mesoamericano de Estudios sobre Tecnologia Apropiada, Guatemala City.
Fichas Populares sobre Plantas Medicinales (Popular Notes on Medicinal Plants),
Armando Caceres, Lidia Giron, David Hernandez, Edgardo Caceres, and David Sapper. Sep 80, 325p
Text in Spanish.

Keywords: *Medicinal plants, Taxonomy, Identifying, Growth, Harvesting, Cultivation, Chemical properties, Developing country application.

This book was prepared for the rural health worker or paramedic. It contains comprehensive information on 81 different plants, giving the scientific, common, and local names; an illustration of the plant for easy recognition; conditions of growth; the medically usable parts; where it grows; harvesting and cultivation; principal components of the plant.

PB83-215707/GAA PC **A04**/MF **A01**
Brackishwater Aquaculture Development Centre, Djepara (Indonesia).
Bulletin of the Brackishwater Aguaculture Development Centre. Volume 7, Numbers 1 and 2.
Jul 81, 65p
See also PB82-117326. Also pub. in ISSN-0216-4000.

Keywords: *Aquaculture, Brackish water, Growth, Field tests, Ponds, Feeding stuffs, Survival, Indonesia, Developing country application.

Macrobrachium rosenbergii has been introduced to the farmers as a new commodity which has a good prospect in the future. To assure that it is profitable and technically acceptable to the farmers, field tests were conducted in Central and East Java provinces. The test pond varies from 600 sq.m. to 2000 sq.m. in area, and stocking rate varies from about 1.5 to 5.8 juveniles/sq.m. Mono and polyculture with finfish were carried in the test. Prawns were fed with ricebran and chicken broiler starter on varying amount. The culture period is 3 to 7 months and the yield correspondingly ranges from 516 kg to 2 240 kg/ha/yr with survival rate of 22 - 73%.

PB83-215954/GAA PC **A04**/MF **A01**
Centro Mesoamericano de Estudios sobre Tecnologia Apropiada, Guatemala City.
Experiencias en la Reconstruccion de la Vivienda Rural y Sub-Urbana (Experiences in the Reconstruction of Rural and Suburban Houses),
Rodolfp Castillo Peralta. Apr 77, 73p
Text in Spanish. Papers presented to the National Seminar on Appropriate Technology (1st) held in Panajachel, Guatemala on 31 March-3 April 1977.

Keywords: *Earthquakes, *Construction, *Earthquake engineering, Construction materials, Mud, Cements, *Guatemala, Developing countries, Construction costs, *Adobe, Developing country application.

This book consists of several papers outlining the experiences of several different reconstruction and development organizations in rebuilding houses after the Guatemalan earthquake of 1976. The different types of building materials used were mud, mud and cement block, cement block, pressed earth, adobe, wood, and wattle and daub. Brief descriptions of the houses, their financing, and other pertinent information are given.

PB83-215962/GAA PC **A04**/MF **A01**
Centro Mesoamericano de Estudios sobre Tecnologia Apropiada, Guatemala City.
Medicina sin Doctores. Diagnostico y Tratamiento de Algunas Afecciones Comunes (Medicine without Doctors. Diagnosis and Treatment of Some Common Infections),
Alexander Dorozynski. 1983, 55p
Text in Spanish.

Keywords: *Health, Paramedics, Birth control, Developing country application.

This report introduces the concept of paramedical practice. It also contains a guide to diagnosing and treating various common infections.

PB83-215970/GAA PC **A02**/MF **A01**
Centro Mesoamericano de Estudios sobre Tecnologia Apropiada, Guatemala City.
Anteproyecto y Proyecto Cematita sobre Puzzolana por Construccion (Pilot Project and Project Cematita on Puzzolana for Construction).
Feb 77, 20p
Text in Spanish.

Keywords: *Earthquakes, *Construction, Construction materials, Quality control, Pozzolans, Mortars(Material), Cements, Seismic surveys, Guatemala, Developing countries, *Earthquake engineering, Developing country application.

This project had 5 goals: to standardize the manufacture of construction materials; to control their quality; to modularly coordinate construction materials; to zone seismic regions; and to establish a construction code for Guatemala. The projects first mapped the seismic zones through exploration and laboratory tests, and then studied the use of Guatemalan volcanic pozzolan in mortar and cement.

PB83-215988/GAA PC **A02**/MF **A01**
Ministerio de Educacion, Guatemala City.
Como Hacer una Casa Mas Segura (How to Build a More Secure House).
1983, 22p
Text in Spanish.

Keywords: *Houses, *Earthquake engineering, *Construction, *Building materials, Construction materials, Site surveys, Planning, Wooden structures, Guidelines, Roofs, *Adobe, Developing country application.

This book is a comprehensive how-to book for the amateur homebuilder. It gives richly illustrated, easy-to-follow instructions on how to build a simple, reinforced frame house that will give some protection against earthquakes. Site selection, carpentry, and adobe construction are covered as well as different types of roofs.

PB83-215996/GAA PC **A03**/MF **A01**
Caritas de Guatemala.
Manual para la Construccion de Viviendas con Adobe (Manual for Construction of an Adobe House).
1983, 43p
Text in Spanish.

Keywords: *Construction, *Houses, *Bricks, Manufacturing, Footings, Reinforced concrete, Carpentry, *Adobe.

This manual gives easy and comprehensive step-by-step instructions for building an adobe dwelling. It covers in detail preparing adobe, manufacturing the bricks, site preparation, and the necessary carpentry and masonry required, including the use of reinforced concrete. The book is richly illustrated and contains floor plans for the house, and other architectural drawings.

PB83-216010/GAA PC **A02**/MF **A01**
Centro Mesoamericano de Estudios sobre Tecnologia Apropiada, Guatemala City.
Hacia una Nueva Estrategia de Desarrollo Rural: La Tecnologia Apropiaa y el Terremoto de 1976 (Towards a New Rural Development Strategy: Appropriate Technology and the Earthquake of 1976),
Roberto Caceres, and Jose Asturias. May 78, 21p
Text in Spanish.

Keywords: *Fertilizers, *Rural areas, *Earthquakes, *Disasters, *Guatemala, Mud, Sands, Project planning, Toilet facilities, Developing country application, Biogas, Latrines.

This document covers the following topics: The limits of conventional development programs; the need for a new focus; the concept of appropriate technology; Guatemala's national experience with appropriate technology; local detection of felt needs in a catastrophic situation; three case studies - production and development of CEMAT technology, experimentation and development of latrines which produce fertilizer and biogas, and ovens of mud and sand.

PB83-216028/GAA PC **A04**/MF **A01**
Centro Mesoamericano de Estudios sobre Tecnologia Apropiada, Guatemala City.
Low Cost Housing System for Guatemala (Sistema de Vivienda de Bajo Costo para Guatemala).
Sep 78, 65p
Text in English and Spanish. Prepared in cooperation with Gesamthochschule Kassel (Germany, F.R.)., and Universidad Francisco Marroquin, Guatemala City.

Keywords: *Houses, *Construction, *Building materials, Walls, Methodology, Sands, *Natural resources, Cost comparison, Developing countries, *Guatemala, Developing country application.

This report contains information on two wall systems to build low cost housing using abundant materials in the Guatemalan highland, loam and pumice sand. Both prototypes compare very favorably in cost and erection time with a similar dwelling built in cement block. The earthquake resisting characteristics of both prototypes were favorable. The subjects covered are: Description of the project; local building technology (building materials, bamboo, wattle and daub construction, cane walls, straw roofs, corrugated metal sheets); San Lucas Project - criteria for site selection, selection of building materials and techniques, bamboo reinforced stone foundation, bamboo reinforced loam wall, pumice filled bag wall system, curing bamboo with smoke, and a cost analysis. The book is richly illustrated with photographs and technical drawings and includes a section, a loam stove.

PB83-216754/GAA PC **E06**/MF **E01**
Sveriges Lantbruksuniversitet, Uppsala. Institutionen foer Mikrobiologi.
Some Aspects of the Use of Microbial Cultures for Fermentation and Storage of Feed Products.
Doctoral thesis,
Sven Lindgren. c1983, 113p ISBN-91-576-1531-4, 16
Also pub. in ISSN-0348-4041. Errata sheet inserted.

Keywords: *Microbiology, *Food storage, Degradation, Nitrogen, Amino acids, Peptides, Aerobic processes, Deterioration, Theses, Fishes, Antibiotics, Safety, Food storage, Fungi, Bacteria.

A mixed culture of Pediococcus acidi-lactici and Lactobacillus plantarum has been evaluated as an inoculant for fermentation of vegetable silages, fish and slaughterhouse offal. A rapid homolactic acid production was initiated as a result of the inoculation. A pH below 4.5 was obtained within 30 h at 24C. The acid production was initially caused by the pediococci and later by the lactobacilli. Growth of competing clostridia and species belonging to the families Enterobacteriaceae and Vibrionaceae was prevented and the initial levels were reduced. The Pediococcus-Lactobacillus culture filtrate could also be used for demonstrating an antispoilage effect on fish and shellfish during non-fermented chill storage. (Copyright (c) 1983 SVEN LINDGREN.)

PB83-216770/GAA PC **E09**/MF **E09**
Indian Standards Institution, New Delhi.
ISI (Indian Standards Institution) Handbook of Food Analysis. Part 11. Dairy Products.
c1981, 194p

Keywords: *Food, Handbooks, Developing countries, Food composition, Milk, Butter, Standards, India, Developing country application.

With the growth of indigenous food industry, need has been felt for a consolidated publication on methods of analysis for various foods. These methods have been selected from the existing Indian standards on various food products as well as methods of analysis. Methods of analysis for dairy products have been described in this handbook. Specific subjects examined are: Rapid examination of milk; chemical examination of milk; bacteriological analysis of milk; cream; butter; ghee; sterilized and flavored milk; condensed milk; infant milk foods; processed cereals; vegetable protein; milk powder; malted milk; lactose; casein; hard cheese; ice cream; dried ice cream milk; fermented milk products; chhana; khoa; burfi; canned rasogolla; Indian standards on dairy products; and degrees brix, specific gravity, and degrees baume of sugar solutions.

PB83-216812/GAA PC **A06**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.

Urbanization. Sector Working Paper.
Jun 72, 114p

Keywords: *Migration, *Demography, *Urbanization, Rural areas, Population migrations, Unemployment, *Housing, Land use.

Problems of urban poverty and unemployment, of inadequacy of housing and urban infrastructure, have been recorded throughout history. What most distinguishes the current urban problems of the developing countries is their scale and intensity. The severity of the problems reflects primarily the rapidity of overall population growth and the acute shortage of resources with which to equip the additions to urban population. The World Bank recently decided to supplement its activities in individual sectors with a more direct focus on problems of urbanization. As this is a new field for the Bank, the discussion and policy proposals contained in this paper are more tentative than for fields in which the Bank has many years' experience.

PB83-216820/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Rural Electrification. A World Bank Paper.
Oct 75, 83p

Keywords: *Rural areas, *Electric power, *Economic analysis, Developing country application.

After an introductory review of rural electrification in developing countries, the report discusses three main topics: (1) the prospects for successful investment in rural electrification; (2) approaches to investment from the point of view of economic justification, identification, and preparation of projects, finance, technical problems, and institutional problems; and (3) implications for the World Bank's policy and procedures.

PB83-216838/GAA PC **A05**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Housing. Sector Policy Paper.
May 75, 78p

Keywords: *Housing, Policies, Developing countries, Self-help.

This paper approaches the housing situation from the standpoint of effective housing demand. The costs of dwelling units of varying sizes, standards and locations are compared with the ability of low-income groups to pay. It is suggested that housing (including sites and services and other self-help methods of construction) could be provided without significant subsidy for at least 80% of the population of most cities. It appears that in relatively higher-income countries most of the lowest 20% could be reached with small subsidies. In very large, lower-income cities it is more difficult for the poorer segments of the population to be reached. In these instances, squatter area upgrading appears to hold the most promise.

PB83-216846/GAA PC **A06**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Balancing Trickle Down and Basic Needs Strategies: Income Distribution Issues in Large Middle-Income Countries with Special Reference to Latin America.
Working paper,
Marcelo Selowsky. c1979, 119p WP-335

Keywords: *Latin America, *Income, Distribution systems, Social welfare.

This paper addresses income distribution issues and explores various policy options to eliminate extreme poverty in a particular typology of middle income developing countries. The countries included in the typology are characterized by a relatively high per capita income (above US$600 per year in 1976), a relatively high degree of industrialization (industry representing over 30 percent of GNP), a rather large size both in population and area, and relatively well endowed resources in agriculture. A distinctive feature is a strong inequality in the distribution of income and wealth relative to other countries of similar levels of per capita income. The typical countries characterizing the typology are Brazil, Colombia, Ecuador, Mexico, Peru, and Turkey. Because the Latin American countries included represent two-thirds of the population of the region, this report is basically addressed to that region. (Copyright (c) 1979 by the World Bank.)

PB83-216853/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Price Distortions in Agriculture and Their Effects: An International Comparison.
Working paper,
Malcolm D. Bale, and Ernst Lutz. c1979, 29p WP-359

Keywords: *Economic analysis, *Agriculture, Production, Food consumption, Employment, Economic impact.

The central thesis of this paper is that agricultural pricing policies pursued by developing countries produce effects which are diametrically opposite to those produced by the pricing policies of many developed countries, and that the policies of both are costly in terms of global welfare. In general, the agricultural sector in developing countries is heavily taxed while that in the developed countries receives substantial price protection. The effects of agricultural price distortions on output, consumption, trade and rural employment are estimated for nine countries. (Copyright (c) 1979 by the World Bank.)

PB83-216879/GAA PC **A04**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Changing International Division of Labor in Manufactured Goods.
Working paper,
Bela Balassa. c1979, 58p WP-329

Keywords: *International trade, *Employment, Manufacturing, Unskilled workers, Technology innovation, Developing countries.

This paper reviews recent changes in trade in manufactured goods between developed and developing countries and examines the employment effects of this trade for the former group of countries. It is shown that the developing countries have assumed increased importance as markets for developed country exporters and that these trends are expected to continue in the future.

PB83-217190/GAA PC **A03**/MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Prevalence of Calorie Deficient Diets in Developing Countries.
Working paper,
Shlomo Reutlinger. c1980, 37p WP-374

Keywords: *Diseases, *Health, *Food, *Nutrition, Calories, Nutritional deficiency diseases, Estimates.

This paper reports further research on the measurement of the extent of malnutrition in developing countries. The authors utilized readily available per capita calorie consumption and income distribution data to deduce personal calorie distributions for selected countries. The major new feature of the estimates is that inter-personal variations of calorie intakes and requirements within each income group are taken into account in a probabilistic way to predict the number of people with calorie deficient diets.

PB83-217261/GAA PC **A02**/MF **A01**
Instituto Tecnologico de Costa Rica, Cartago. Centro de Investigacion de Ingenieria en Maderas.
Diseno y Ensayo de Vigas de Madera Compuestas (Design and Testing of Box Beam of Partical Boards),
Juan Tuk, and Federico Picado. Jun 81, 10p
Text in Spanish.

Keywords: *Buildings, *Wood, *Particle boards, *Wood products, Box beams, I beams, Loads(Forces), Bend tests, Wooden structures, Developing country application.

Two types of beams--I beams and box beams--were designed and tested by bending. Webs (of beams) were built using medium-density particleboard of 12 mm. thickness, interior type. Flanges were built using Caobilla (Carapa sp) wood of structural grade number two. Results showed lower values for the loading system than the expected ones. Earlier shear failure near the supports were observed. Elastic deflection was greater than calculated based on properties obtained from control material.

PB83-217299/GAA PC **E10**/MF **E10**
Indian Inst. of Tech., Bombay.
Indo-French Workshop on Urban Transportation, January 11-14, 1983,
Ruth S. DeFries-Bajpai, and J. N. Bajpai. Jan 83, 214p

Keywords: *Urban planning, *Transportation, *Transportation management, Policies, Developing countries, France, India, Transportation planning.

This workshop provided a forum for French-Indian experts to share their experience both in developed and developing countries. This volume contains 11 papers presented in the workshop by various experts. The papers cover the full spectrum of urban transportation issues beginning from macro-level planning strategies to the details of operation, design and implementation aspects of the transportation system.

PB83-217307/GAA PC **E17**/MF **E17**
Indian Inst. of Tech., Bombay.
Proceedings of the National Symposium on Catalysis (4th) (Catalysis Society of India), December 2-4, 1978.
Dec 78, 520p

Keywords: Technology, Catalysis, *Industrial plants, Adsorption, Physical chemistry, Deactivation, Chemical reactions, Heterogeneous reactions, Homogeneous reactions.

This symposium was organized to provide a forum for exchange of views, presentation of advanced knowledge and creation of greater interest and wider understanding on the progress of science and technology of catalysis. This volume contains the various papers presented in the symposium. A total number of 60 papers were presented. These have been divided into 9 groups: Industrial Catalysis; Adsorption; Slurry Systems/Catalyst Deactivation; Physiochemical Characterization; Heterogeneous Catalysis; Homogeneous Catalysis; and Poster Session.

PB83-217372/GAA PC **E06**/MF **E06**
Central Inst. of Road Transport, Poona (India).
Proceedings of a Workshop on Fuel and Oil Economy, August 24-26, 1977
Aug 77, 115p

Keywords: *Fuels, *Petroleum, Foreign technology.

This workshop was organized to discuss and highlight the role and limitations of various means of effecting fuel and oil economy, to exchange information on results achieved and for this purpose to provide a forum for cross-fertiliberation of ideas and to provide guidelines to those who have not yet taken any concrete steps in this direction. The proceedings contain various papers presented and the summary of discussions. The various topics covered are: Technical Measures for Fuel Economy; Managerial Aspects of Fuel Economy; Technical Measures for Control on Oil Consumption; Oil Reclamation; Fuel Economy Measures for Petrol; and Managerial Aspects of Oil Economy.

PB83-217570/GAA PC **A08**/MF **A01**
Center for Energy and Environment Research, Caparra Heights, PR.
Proceedings of UNICA Workshop on Biomass as an Alternative for the Caribbean Held at San Juan, Puerto Rico on April 28-29, 1982,
Juan A. Bonnet, Lewis Smith, William E. Eilers, Jairo F. Lascarro, and Harry M. C. Kaspers. Apr 82, 171p
CEER-B-156
Sponsored in part by Department of Energy, Washington, DC. Text in English and Spanish.

Keywords: *Biomass, *Methane, *Fuels, *Economic analysis, Anaerobic processes, Sources, Substitutes, Energy sources, Solid wastes, Developing country application, Caribbean Sea.

The papers of the workshop presented in this report are: Biomass Opportunities in the Caribbean; Caribbean Energy Activities Supported by USAID; El Concepto de Integracion de Sistemas de Energia a las Granas Agricolas; Bioenergy from Anaerobically Treated Waste Water; El INRA Dentro del Dominio de la Energia Biomasica; Bioconversion of Strong Organic Waste Streams to Methane Gas - The Bacardi Corporations' Anaerobic Treatment Process; Biomass - A Potential Energy Source for Jamaica; Alcohol Fuels from an Integrated Biomass System - Technology and Economics; and Report on Biomass as an Energy Alternative for the Caribbean Workshop.

PB83-217646/GAA PC **A02**/MF **A01**
Instituto Tecnologico de Costa Rica, Cartago. Centro de Investigacion de Ingenieria en Maderas.
Tableros de Virutas Aglomeradas con Cemento Portland (Wood - Portland Cement Particle Boards),
Juan B. Tuk. Sep 79, 16p
Text in Spanish.

Keywords: *Wood, *Particle boards, Portland cements, *Wood products, Fractures(Materials), Elastic properties, Density(Mass/volume), Developing country application.

Research was done to establish the physical and mechanical properties for wood-cement particle boards. Two species of wood were tested: Guarea sp. and Cupressus lusitanica. The furnish was produced by regular palners, and machine saws available in any furniture factory. Correlations between specific gravity and mode of rupture, specific gravity and mode of elasticity, and mode of rupture and mode of elasticity were obtained and are outlined in tables and graphs.

PB83-217653/GAA PC **A08**/MF **A01**
Center for Energy and Environment Research, San Juan, PR.
Enfoque Biotropical para la Arquitectura en Puerto Rico (Biotropical Focus for Architecture in Puerto Rico),
Pedro Antonio Muniz. 1981, 169p CEER-C-146
Text in Spanish. Sponsored in part by Department of Energy, Washington, DC.

Keywords: *Buildings, *Environmental impacts, *Solar cooling systems, *Solar heating systems, *Tropical regions, Solar radiation, Heating, Cooling, Developing country, Puerto Rico, Developing country application.

This book explores the possibilities of using architecture to create buildings which are in harmony with the climate of their region, and so can avoid expensive mechanical solutions to heating, cooling, and other problems. The chapters of the book are titled: Passive technology; A Primitive Consciousness; The Tropical Zone; Climatic Elements and Controls; The Climate and Man; Solar Radiation; Solar and Climatic Control (building orientation, building shape, interior organization, building cover, sun shades, shutters, awnings, and protection of mirrors); Ventilation; Vegetation and Subterranean Cooling; and Tables and Charts.

PB83-217661/GAA PC **A02**/MF **A01**
Puerto Rico Univ., Mayaguez.
Produccion de Metano Usando un Filtro Anaerobico (Production of Methane Using an Anaerobic Filter),
Knud B. Pedersen. Aug 78, 25p
See also ANL-Trans-1164. Text in Spanish.

Keywords: *Methane, *Energy source development, *Sewage treatment, Chemical equilibrium, Developing country application.

This investigation evaluates the viability of Puerto Rican conditions for producing methane from domestic waste water using an anaerobic filter. It found that gas began to be produced in 20 days, and then took 8 days to reach an equilibrium. The more organic matter in the water, the more gas is produced. The percentage of methane in the gas produced varied from 80% to 89% depending on the rate of the fluid (the rates were 157.5 m./min. and 94.5 ml. min respectively.) The heating value of the gas was at least 5.34 Kcal/l of gas. A retention time for the liquid is necessary. Domestic waste water can be used as a source of energy.

PB83-217737/GAA PC **A11**/MF **A01**
National Research Council, Washington, DC. Committee on Population and Demography.
Levels and Recent Trends in Fertility and Mortality in Columbia,
Hania Zlotnik. 1982, 236p 12
Contract AID/pha-C-1161, Grant AID/DSPE-G-0061

Keywords: *Fertility, *Colombia, *Demography, Populations, Trends, Statistical data, Mortality, Adults, Children, Infant mortality.

Applying a variety of indirect estimation techniques to available data, this study constructs estimates of fertility and mortality levels and trends during the recent past. The demographic profile of Columbia during the last decade can be fairly well established in terms of fertility and infant and child mortality, but solid estimates of adult mortality are still lacking.

PB83-217836/GAA PC **A07**/MF **A01**
Iowa State Univ., Ames. Dept. of Economics.
Effect of Agricultural Land Use Practices on Stream Water Quality: Economic Analysis.
Final rept. Oct 79-Jul 81,
John A. Miranowski, Michael J. Monson, James S. Shortle, and Lee D. Zinser. Jun 83, 136p EPA-600/5-83-001

Keywords: *Land use, *Agriculture, *Farming, *Management techniques, *Water pollution, Watersheds, Four Mile Creek, Cost effectiveness, Policies, Soil loss, Erosion control, Incentives, Risk, Iowa.

Effective management of agricultural nonpoint source pollution requires that economically feasible land use practices be selected and implemented. Since nonpoint source pollution from agricultural lands can be controlled by best management practices (BMPs), a food understanding of the response of farmers to incentive and regulatory policies is needed. This report provides an economic analysis of agricultural production activities and farmer response to water quality controls, using the Four Mile Creek Watershed in Iowa as a case study. The analysis showed that secondary tillage practices are important in designing cost-effective control strategies. Knowledge of perceived risk associated with practices is critical in determining farmer adoption of BMPs and response to control policies. Also, data on perceived opportunity costs of certain practices provided further understanding of farmers' reluctance to adopt those practices.

PB83-217851/GAA PC **A03**/MF **A01**
Northwestern Univ., Evanston, IL.
Structural Basis for the Mechanical Properties of Polyethylenes.
Annual rept. Dec 81-Nov 82,
S. H. Carr, B. Crist, and T. J. Marks. May 83, 35p GRI-81/0132
Contract GRI-5081-260-0538

Keywords: *Pipes, *Plastics, Tensile properties, Molecular weight, Toughness, Plastic pipes, Polymeric chains, Polymeric branching.

The physical properties of polyethylene, the material used in gas transmission pipes, are ultimately determined by the nature of the polymeric molecules in the resin used in pipe manufacture. This relation between molecular structure and properties is based on the morphology formed in the polyethylene by a particular processing history. Model polyethylenes having very narrow molecular weight distributions and well defined levels of short chain branching and long chain branching have been used to quantify the effects of molecular structure on mechanical behavior.

PB83-218099/GAA PC **A07**/MF **A01**
National Research Council, Washington, DC. Committee on Population and Demography.
Fertility Decline in Indonesia: Analysis and Interpretation,
Geoffrey McNicoll, and Masri Singaimbun. 1983, 146p 20
Contract AID/pha-C-1161, Grant AID/DSPE-G-0061

Keywords: *Fertility, *Demography, *Indonesia, Populations, Trends, Statistical data, *Contraceptives.

Indonesia's fertility has declined significantly since the late 1960s. This study sets out the complexity of the circumstances in which the fertility decline took place, assembles the available information on its pattern and proximate determinants, and seeks to identify the underlying factors responsible.

PB83-218107/GAA PC **A02**/MF **A01**
Puerto Rico Dept. of Natural Resources, San Juan.
Introduccion a la Ecologia del Manglar (Introduction to the Ecology of Mangroves),
Gilberto Cintron. May 81, 24p
Text in Spanish.

Keywords: *Ecology, *Forestry, Geography, Distribution(Property), Production, *Tropical regions, Biomass, Economic factors, Management, Environmental impacts, Developing country application.

Mangrove swamps are the most highly productive ecological systems in the world, being vital to the early stages of almost all marine life, either directly or indirectly. This study acquaints the reader with mangrove activity and mangrove use. It covers the species, biogeography, latitudinal limits, physiographic types, structural characteristics, productivity, the mangrove as the base of tropical ecosystem, silviculture, soil, biomass, zonation and succession, management, impact of stresses on the mangrove system.

PB83-218115/GAA PC **A04**/MF **A01**
Puerto Rico Dept. of Natural Resources, San Juan.
Mangrove Forests: Ecology and Reponse to Natural and Man Induced Stressors,
Working paper,
Gilberto Cintron, and Yara Schaeffer-Novelli. May 82, 52p
Prepared in cooperation with Sao Paulo Univ. (Brazil) Inst. de Oceanografico. and West Indies Lab., St. Croix, VI.

Keywords: *Ecology, *Forestry, Distribution(Property), Humus, Acclimatization, Vulnerability, Climatology, Fisheries.

Mangrove swamps have been found to be one of the most productive zones of organic matter on the planet. They are vital to the early stages of most marine life, either directly or indirectly. This very comprehensive report covers the following factors: Mangrove distribution; species; adaptations and zonation; zonation and succession; physiographic types (riverine, fringe, basin, and dwarf forests); productivity; decomposition and use of litterfall; fisheries; climatic constraints on development; vulnerability to stressors (Natural-tropical cyclones, tidal waves, eustatic sea level rise and coastal erosion, and hypersalinity; Man induced - channelization, impoundment, sedimentation, thermal pollution, oil, mining); Recovery; Conclusion - conservation needs.

PB83-218131/GAA PC **A02**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg.
Microbiological and Chemical Studies on the Anaerobic Conversion of Coal-Derived Compounds to Methane.
Annual rept. Feb 82-Feb 83,
J. G. Ferry, and R. E. Winans. Mar 83, 24p* GRI-81/0151
Contract GRI-5081-260-0569
Prepared in cooperation with Argonne National Lab., IL.

Keywords: *Methane, *Microbiology, Oxidation, Bacteria, *Fuels, *Coal, Biological processes, Chemical treatment.

A combined chemical and biological approach for the conversion of coal to methane at ambient temperatures was investigated. Coal was solubilized to water soluble products that were evaluated for their biodegradability to methane by mixed cultures of anaerobic bacteria. Several pure aromatic compounds known to be present in coal oxidation products, were converted to methane by microbial consortia derived from natural habitats. Mixtures of coal oxidation products were not converted to methane by microbial populations (consortia) found in nature. However, the oxidation products did not inhibit methane formation from other substrates. These results suggest that the biological potential exists for the conversion of coal oxidation products to methane. Adaptation of natural microbial communities may be necessary to develop consortia that degrade coal oxidation products.

PB83-218149/GAA PC **A03**/MF **A01**
Puerto Rico Univ., Mayaguez. Dept. of Civil Engineering.

Operacion del Proceso de Lodos Activados Mediante el Uso de la Curva de Sedimentacion de Lodos (Processing Active Mud by Using a Curve of Sedimentation of Mud),
Jorge Rivera Santos, and Tang Ninghsi. 1982, 36p
Text in Spanish. Sponsored in art by Pan American Federation of Engineering Societies.

Keywords: *Waste recycling, *Sewage treatment, Solids, Separation, Biochemical oxygen demand, Aeration tanks, Settling, Mathematical models, Consolidation, Liquids, Concentration(Composition), Circulation, Activated sludge process, Developing country application.

Many operational problems which cause the deterioration of quality of the effluent of plants which treat active mud are associated with a poor functioning of the stage of separation of biological solids from the treated liquid. The inefficient capture of these solids results in a greater biochemical demand for oxygen and an ineffective consolidation of the captured solids before their recirculation, resulting in a less efficient use of the aeration tank. This problem can be avoided by proper maintenance of the settling tank and secondary settling tank in equilibrium, using the concept of 'state point.' A dynamic model was used to determine the characteristics of the mixed liquid at various suspended concentrations at given times. Once the optimal concentration has been determined, the volume of recirculation necessary to maintain equilibrium can be determined and maintained.

PB83-218305/GAA PC **A05**/MF **A01**
National Information Centre for Leather and Allied Industries, Madras (India).
Technological Controls in Leather Manufacture,
S. Bangaruswamy. c1980, 77p NICLAI/SER-1

Keywords: *Leather, Manufacturing, Technology, Standards, Tanneries, Developing country application.

In recognition of the importance of quality control and standardization, this monograph was published for the benefit of the leather industry. This monograph contains information on a wide range of very useful and simple tests that can be applied during the processing of leathers starting from raw materials, process controls and testing/analysis of leathers for product control. Important physical and chemical characteristics of different types of leathers are indicated. Mention is also made of the applications of tests relevant to different types of leather. Bibliographical references and the lists of suppliers of physical testing equipment given in the monograph may prove helpful to set up a control laboratory in the tanneries.

PB83-218313/GAA PC **A04**/MF **A01**
National Information Centre for Leather and Allied Industries, Madras (India).
Animal Blood in Food, Feed, Fertilizer, Industry, Medicine and Laboratory,
S. Divkaran. c1980, 68p NICLAI/SER-2

Keywords: *Animal wastes, *Animal feeds, *India, *Food, Feeding stuffs, Industries, Laboratories, Proteins, Shortage, Drugs, Developing country application.

This review on animal blood is an attempt to bring into one compilation, the entire state of art, as it exists today, on the various end-uses for animal blood. It will be of interest to note that animal blood has found application in many industries. Viewing objectively the predicted world protein shortage and malnutrition, the use of animal blood in the feed, food and pharmacy appears to win a greater justification than its use in other industrial applications. Such an application is of far more greater relevance in the developing countries where acute shortage of protein is a scourge. Synthetic polymers may be expected to totally replace the industrial uses for blood in the near future. This review can be expected to serve a dual role.

PB83-218321/GAA PC **A04**/MF **A01**
Puerto Rico Univ., Rio Piedras. Agricultural Experiment Station.
Conjunto Tecnologico para la Produccion de Hortalizas (Technological System for the Production Of Vegetables),
Raul Abrams. Mar 79, 71p PUB-102
Text in Spanish.

Keywords: *Productivity, *Vegetables, *Puerto Rico, Climate, *Tropical regions, Planting, Cultivation, Pest control, Harvesting, Irrigation, Developing country application.

This publication outlines in simple terms the best procedures for the production of vegetables in Puerto Rico and similar climatic regions. Sowing, cultivation, protection against pests, harvest, and watering are covered for the following plants: Eggplant; squash; onion; Sweet corn (maize); melon; cucumber; pepper; cabbage; watermelon; tomato; and beans.

PB83-218339/GAA PC **A03**/MF **A01**
Puerto Rico Univ., Mayaguez. Dept. of Civil Engineering.
Renewable Energy Technologies: Models in the Energy Planning for Puerto Rico,
Jorge Haddock Acevedo. 1982, 30p

Keywords: *Electric power, *Renewable energy, Electric power generation, Biomass, Mathematical models, Cost analysis, Puerto Rico, Technology, Energy substitution, Developing country application, Energy policy, Ocean thermal energy conversion.

Puerto Rico now depends for 99% of its energy needs on petroleum. The nuclear alternative is not politically acceptable, so Ocean Thermal Energy Conversion (OTEC) combined with photovoltaics is the most promising renewable resource for energy. Wind power generation is not as economic since huge turbines are required for relatively little outputs of power. Biomass is also a viable alternative. Reduction in the dependence on oil is not only economically advantageous, but will also reduce environmental pollution.

PB83-218347/GAA PC **A03**/MF **A01**
Puerto Rico Univ., Mayaguez. Dept. of Civil Engineering.
Effect of the Soil in the Prevention of Groundwater Pollution from Sanitary Landfill Leachates,
Luis A. del Valle, and Ralu E. Sapata Lopez. 1982, 32p
Sponsored in part by office of Water Research and Technology, Washington, DC.

Keywords: *Soils, *Water pollution, *Ground water, *Leaching, Retaining, Percolation, Equilibrium, Metals, Conductivity, Sampling, Chemical analysis, Oxygen, Dissolved gases, Developing country application, Sanitary landfills.

This study first investigated the characteristics of leachates from sanitary landfills, and then made core samples of different soils and studied their properties. Finally leachates were percolated through the soil columns to study the effects of the interaction of both materials. The study concluded that sanitary landfill leachate characteristics vary widely even at the same site. The Mayaguez site prevented most of the leachate from contaminating groundwater. Although three different soils used in the study showed varied behaviors with regard to the retention or release of different materials during the course of this project, the relative specific conductance in the filtered leachates approached a value of unity at about half way through the run. This seems to indicate that some sort of equilibrium was reached by means of which no more net transfer of soluble material occurred.

PB83-218354/GAA PC **A03**/MF **A01**
Puerto Rico Dept. of Natural Resources, San Juan.
Environmental Impact of Sand Extraction Activities on the Insular Shelf.
Working paper,
Gilberto Cintron. Jul 81, 32p
Inshore and Nearshore Resources Training Workshop held at Suva, Fiji on July 13-17, 1981.

Keywords: *Mining, *Coasts, *Environmental impacts, Economic impact, Beaches, Reefs, Coral, Sea grasses, Beach nourishment, Regulations, Dredging, Developing country application.

The submarine shelves of continents and islands often harbor many valuable natural resources, including offshore sand deposits. Sand is, however, more often taken from land. Mining from both sites may lead to devastating environmental and economic impacts if proper caution is not exercised. This report highlights the dangers of mining without consideration of environmental impacts. It covers: Sources and sinks of shelf sediments; impact of sand extraction on beach processes; biological considerations (coral reefs, sedimentation and coral reefs, sedimentation and seagrass beds, and importance of reefs and seagrass beds); impact of dredging on biological systems; recovery of damaged systems; dredging methods; and conclusions.

PB83-218362/GAA PC **A07**/MF **A01**
National Information Centre for Leather and Allied Industries, Madras (India).
Utilization of Dead Animals and Condemned Animal Offals,
S. Divakaran. c1981, 140p NICLAI/SER-4

Keywords: *Waste recycling, Utilization, Byproducts, *Animal wastes, Solid wastes, Developing country application, Carcasses.

This monograph is an attempt to spell out 'Dos' and 'Don'ts' with regard to utilization of animal wastes. The techniques described include urban and rural situations, describing potentialities both large and small scale. Quality standards and quality assessments are emphasized in the production techniques, keeping in mind the basic limitations in raw material choice for quality. This monograph is expected to cater to the needs of a wide range of categories of persons viz., the village headman, the manager of a by-product unit or an abattoir, the renderer, the public health authorities, the veterinarians, the sociologists and the economists, each one finding something specific to look for. The importance of this publication stems from the fact that the manufacture of products from animal waste is a down-to-earth social responsibility appended with a reasonable margin of profit.

PB83-218370/GAA PC **A03**/MF **A01**
Puerto Rico Dept. of Natural Resources, San Juan.
Impact of Oil in the Tropical Marine Environment.
Technical pub.,
Gilberto Cintron, Ariel E. Lugo, Ramon Martinez, Barbara B. Cintron, and Luis Encarnacion. Nov 81, 46p
Prepared in cooperation with Institute of Tropical Forestry, Rio Piedras, PR.

Keywords: *Petroleum, *Water pollution, *Ecology, *Coasts, Dispersing, Reefs, Toxicity, Sea grasses, Damage, Water pollution control, Beaches, Cleaning, Recovery, Vulnerability, Developing country application, Oil spills, Mangroves.

Oil spills have a devastating effect on biologically rich coastal environments. This report investigates this problem, covering damage by oil to biological systems, the use of dispersants (toxicity and considerations for dispersant use), impact of oil and dispersants on coral reefs, impact of oil on seagrass beds and sandy beaches, impact of oil on mangroves (seedling survival and tolerance, regeneration, forest type vulnerability, and cleanup and recovery activities in mangroves), conclusions, and recommendations. The study concludes that coral reefs and seagrass beds may escape significant spill damage if pollution is not chronic and if dispersants are not used. Sandy and rocky shores may be severely impacted but recover quickly. Mangroves are the most vulnerable coastal ecosystem. Recommendations are that oil spill contingency plans must be prepared for all areas, and that the necessary equipment for the plans must be in place.

PB83-218503/GAA PC **A07**/MF **A01**
National Research Council, Washington, DC. Committee on Population and Demography.
Socioeconomic Determinants of Fertility Behavior in Developing Nations: Theory and Initial Results,
Barbara Entwisle, Albert I. Hermalin, and William M. Mason. 1982, 144p 17
Contract AID/pha-C-1161, Grant AID/DSPE-G-0061

Keywords: *Fertility, *Demography, Research, Mathematical models, Comparison.

This comparative study presents the initial theoretical and empirical results of the Michigan Comparative Fertility Project which is devoted to comparative research on reproductive behavior. The report has two chapters. Chapter 1 develops a microlevel specification that distinguishes three components of the fertility process. These components lead to a block-recursive structural equations model. The comparative aspect of this research models variability in the micro relationships across societies. Chapter 2 presents highly tentative and preliminary empirical results for a subset of the micro-equation system developed in Chapter 1.

PB83-218545/GAA PC **A11**/MF **A01**
National Research Council, Washington, DC. Committee on Population and Demography.
Fertility in Thailand: Trends, Differentials, and Proximate Determinants,
John Knodel, Apichat Chamratrithirong, Napaporn Chayovan, and Nibhon Debavalya. 1982, 240p 13
Contract AID/pha-C-1161, Grant AID/DSPE-G-0061

Keywords: *Contraceptives, *Fertility, *Demography, *Thailand, Populations, Trends, Statistical data, *Contraception.

This study focuses primarily on the proximate determinants of fertility, i.e., those variables that directly link childbearing to all other influences. The most important proximate determinants of the Thai fertility decline have been those associated with deliberate marital fertility control, particularly contraception.

PB83-218826/GAA PC **A04**/MF **A01**
Texas Transportation Inst., College Station.
Passenger Car Equivalents for Rural Highways.
Final rept. 21 Sep 80-28 Feb 82,
Wiley D. Cunagin, and Carroll J. Messer. Dec 82, 55p FHWA/RD-82/132
Contract DTFH61-80-C-00128

Keywords: *Transportation, *Automobiles, *Roads, Trucks, *Buses(vehicles), Vehicular traffic.

The objective of this work was to determine the passenger car equivalent value for fourteen different vehicle types under varying traffic and roadway geometry conditions. This was accomplished by analyzing field data collected in several states on both two-lane and four-lane highways. Data included headways, speeds and travel times by vehicle type, traffic volume condition, and roadway section type. An analytical model was developed to estimate passenger car equivalent values based upon speed distributions, traffic volume, and vehicle type. The calibrated model was used to estimate passenger car equivalent values for fourteen vehicle types under the specified typical conditions for two-lane and four-lane rural highways.

PB83-218941/GAA PC **A14**/MF **A01**
Scientific Process and Research, Inc., Highland Park, NJ.
New Technique for Plastics Processing,
Imrich Klein, and Reuben Klein. 16 Feb 83, 323p NSF/ECS-83001
Contract NSF-DAR78-21356

Keywords: *Plastics, *Industrial plants, Manufacturing, Extruding, Temperature, Technology, Performance evaluation, Design criteria, Tables(Data), Graphs(Charts), Energy consumption, Energy use.

The research project deals with the SDS screw, a plastics processing device incorporating a dual, concentrically mounted screw system. Unmelted plastic is drained from the discharge end of the outer screw and led upstream through the inner screw where melting is completed. Experiments confirm that the melting capacity of the extruder can be substantially increased by the installation of an SDS screw. Screws can therefore be designed much deeper than is customary with a correspondingly higher pumping capacity. Deep screws which pump at higher rates also shear the plastic material less. This effect results in lower melt temperature, higher energy efficiency, and absence of temperature fluctuation.

PB83-218990/GAA PC **A03**/MF **A01**
Instituto Nacional de Pesca, Guayaquil (Ecuador).
Guia Practica para la Cria de Camarones Comerciales (Penaeus) en Ecuador (Practical Guide for the Commercial Rearing of Shrimp (Penaeus) in Ecuador),
Medardo Cun. 1982, 35p
Text in Spanish.

Keywords: *Ecuador, *Aquaculture, Marine biology, Construction, *Land use, Harvesting, Feeding(Supplying), Crustacea, Birds, Developing country application, Predation.

This paper contributes, in a technical and practical manner, to the development and installation of Shrimp Ponds. As well as certain financial considerations, the following points are considered: Choice of land; construction systems; general infrastructure; pond seeding; harvesting; and feeding.

PB83-219162/GAA PC **A04**/MF **A01**
Instituto Nacional de Pesca, Guayaquil (Ecuador).
Estudio Ecologico del Mesoplancton del Golfo de Guayaquil Abundancia, Ciclos Nictemerales y Relaciones Entre el Estuario del Rio Guayas y el Oceano (Ecological Study of the Gulf of Guayaquil: Abundance, Nycthemeral Cycles, and Relations between the Estuary of the Rio Guayas and the Ocean),
Rosa Guzman de Peribonio, Robert Repelin, Maria Luzuriaga de Cruz, Daysi Hinostroza, and Maria Elsa Villarroel. Dec 81, 75p
Text in Spanish and French.

Keywords: *Microbiology, *Water pollution, *Coasts, Equatorial zone, Nutrients, Biological productivity, Mixing, Salinity, Inorganic phosphates, Abundance, Circulation, Rio Guayas, Puna Isle, Peru, Developing country application.

This study by the abundance cotation method at the beginning of the dry season, reveals the presence of 2 zones of higher mesoplankton production. The first is situated to the north of Puna Isle, where an upwelling takes place and where oceanic waters meet the Rio Guayas waters. The phytoplankton consumed by the zooplankton in this region results in its main part of the assimilation of the nutrients contained in continental waters. The second productive zone extends from the north of the Gulf (where superficial warm water occurs) to the south end of the equatorial front. The phytoplankton ingested by the zooplankton of the sector grow in the thermoclinal upwelling which appears in the Peruvian Coastal waters. Thus, the biogeneous elements from marine origin are used. The mixopolyhaline waters north of Puna Isle are not very favorable to zooplankton proliferation. The examination of the estuarine-ocean gradient indicates zooplankton concentrations in the deep waters south of Puna Isle and confirms those observed along the thermal front.

PB83-219204/GAA PC **A07**/MF **A01**
Michigan Univ., Ann Arbor. Dept. of Materials and Metallurgical Engineering.
Computer-Aided Design System for Castings.
Progress rept. no. 2, Aug 80-Sep 81,
R. D. Pehlke, J. O. Wilkes, R. A. Flinn, P. K. Trojan, and A. Jeyarajan. Nov 81, 139p NSF/MEA-81031
Grant NSF-MEA78-26171
See also PB83-212258.

Keywords: *Castings, *Computers, Simulation, Thermodynamic properties, Solidification, Economic analysis, Computer programs, Moldings, Microcomputers, Alloys, Acoustic emission testing, Computer applications, Aluminum alloy 356, MSC/NASTRAN computer program.

Problems associated with the computer-aided design of castings are studied. Attention is focused on geometric modeling/physical simulation, the provision of thermal transport data, filling transients associated with the pouring of castings, the modeling of interfacial phenomena, the accurate description of the interaction of the molding medium and the solidifying casting, and the total economics of the computation system itself. Computational costs and alternative simulation methods are examined. It is concluded that the MSC/NASTRAN software package has all the necessary capabilities to adequately simulate the solidification and cooling of a metal casting. This package can simulate variable thermal properties, latent heat effects, variable boundary conditions, combinations of different materials and mold/metal interfacial conditions.

PB83-219212/GAA PC **A03**/MF **A01**
Textiles la Esmeralda S.A., Bogota (Colombia).
Informe del Agua Tratada con Jacintos (Report on Water Treated by Water Hyacinths),
Nohora Duran V, and Virgilio Avila S. 1982, 45p
Text in Spanish.

Keywords: *Aquatic plants, *Water hyacinth, *Water quality, *Water supply, *Hydrology, Water pollution, Industrial wastes, Laboratories, Hydrologic cycle, Adsorption, Roots, Effectiveness.

This study reports on the use of water hyacinths to purify water. Specific subjects covered are: Water quality; the hydrologic cycle; surface water pollution; domestic and industrial waste; work plan; experiments at the plant level; laboratory conclusions; and observations. Water hyacinths are very effective at absorbing pollutants from the water in which they float for a period of three months. At that time they are saturated and the roots begin to rot causing greater pollution problems. However, if the plants are replenished before they are saturated with pollutants, they are very effective.

PB83-219220/GAA PC **A04**/MF **A01**
National Research Council, Washington, DC.
Jojoba: Feasibility for Cultivation on Indian Reservations in the Sonoran Desert Region.
Final rept.
1977, 71p ISBN-0-309-02618-0
Contract DHEW-105-75-6102
Library of Congress catalog card no. 77-79945.

Keywords: Feasibility, American Indians, Industries, Oils, Coatings, Lubricants, Electrical insulation, Waxes, Chemical properties, *Jojoba, Southwestern Region(United States).

This report investigates the desert shrub jojoba (Simmondsia chinensis) which grows in the Sonoran Desert, an area which covers parts of Arizona, California, and Mexico. Jojoba nuts contains a yellowish, odorless, oily liquid commonly referred to as 'jojoba oil.' Jojoba oil has a wide variety of industrial applications in lubricants, paper coatings, polishes, electrical insulation, carbon paper, textiles, leather, precision casting, cosmetics, and pharmeceuticals. Jojoba oil can be hydrogenated to a hard, colorless solid (wax) resembling spermaceti, carnauba wax, and beeswax in both chemical structure and properties. New industrial uses are being considered for this solid wax, including food coatings, polish, and candles.

PB83-219394/GAA PC **A02**/MF **A01**
Southeastern Forest Experiment Station, Asheville, NC.
Legumes in Forestry: Results of Adaptability Trials in the Southeast.
Forest Service research paper.
J. R. Jorgensen, and J. R. Craig. 14 Jun 83, 15p FSRP-SE-237

Keywords: *Leguminous plants, *Forestry, Adaptation, Nitrogen fixation, Grasses, Field tests, Fertilizing, Plant growth, Grazing, Southeastern Region(United States), Lespedeza, Lotus, Trifolium.

More than 50 species of nitrogen-fixing plants were sown on one or more sites. A number of fertilizer treatments, none of which included nitrogen, were used. Only eight perennials and six annuals persisted for more than two growing seasons. Subterranean clover was the most promising annual and sericea lespedeza the most promising perennial tested. The majority of the plant failure were related to physical or chemical properties of soil. Browsing, especially on small plots, was an important factor in limiting the growth and establishment of plants that produced palatable forage.

PB83-219717/GAA PC **A17**/MF **A01**
Transportation Research Board, Washington, DC.
Low-Volume Roads: International Conference, (3rd), 1983,
Lynne H. Irwin, Linda Parsley, Richard Robinson, Lee H. Rogers, and J. D. N. Riverson. 1983, 393p TRB/TRR-898, ISBN-0-309-03511-2
See also PB-299 897. Library of Congress catalog card no. 83-12001. Also pub. as ISSN-0361-1981.
Paper copy copy also available from Transportation Research Board, 2101 Constitution Ave., NW., Washington, DC 20418.

Keywords: *Roads, *Economic analysis, *Pavements, Cost estimates, Developing countries, Rural areas, Pavements, Aggregates, Gravel, Cost effectiveness.

Partial Contents: Critical Concerns of Low-Volume-Road Agencies in the 1980s, New TRRL road investment model for developing countries, Traditional goods and passenger movements in Indonesia, Economic evaluation of pavement design alternatives for low-volume roads, Simplified cost-estimation method for low-volume roads, Estimating road construction costs for sector planning in developing countries, Procedure for determining capacity of unrocked roads, and Economic analysis of soil-cement base construction compared with crushed-rock base.

PB83-219907/GAA PC **A18**/MF **A01**
SCS Engineers, Inc., Long Beach, CA.
Design Manual: Onsite Wastewater Treatment and Disposal Systems.
Final rept.,
Richard J. Otis, William C. Boyle, Ernest V.
Clements, and Curtis J. Schmidt. Oct 80, 411p EPA-625/1-80-012
Contract EPA-68-01-4904

Keywords: *Waste water, *Sewage disposal, *Sewage treatment, Design, Manuals, Residential buildings, Water conservation, Classifications, Construction, Operations, Maintenance, Environmental impacts, Soils, Adsorption, Reliability, Tanks(Containers), Retaining, On site investigations.

Approximately 18 million housing units, or 25% of all housing units in the United States, dispose of their wastewater using onsite wastewater treatment and disposal systems. These systems include a variety of components and configurations, the most common being the septic tank/soil absorption system. The number of onsite systems is increasing, with about one-half million new systems being installed each year. This document provides information on generic types of onsite wastewater treatment and disposal systems. It contains neither standards for those systems nor rules and regulations pertaining to onsite systems.

PB83-220319/GAA PC **A07**/MF **A01**
RCA Service Co., Camden, NJ.
Final Results of Testing of Abcor 8, Spiral Wound Ultrafilters at the Wrightsville Beach Test Facility-Covering the Period October 1, 1982 to March 31, 1983,
L. H. Fleming. Jun 83, 135p W83-03288, , OWRT-C-00030-D(9405)(1)

Keywords: *Desalination, Tests, Design criteria, Performance evaluation, Membranes, Filtration, Field tests, Flow rate, Temperature, Wrightsville Beach Desalination Plant.

Utilizing 8' diameter spiral wound ultrafilter elements, an experimental system for the pretreatment of seawater was constructed and evaluated. Several different sets of operating conditions were tested. Three main parameters which varied were filtrate conversions, module flowrate and seawater temperature.

PB83-220558/GAA PC **A03**/MF **A01**
South Dakota State Univ., Brookings. Water Resources Inst.
Wind Energy for Low Head Irrigation.
Rept. for Oct 79-Sep 82,
John L. Wiersma, and Alan R. Bender. Apr 83, 41p
W83-03309, , OWRT-B-062-SDAK(1)
Contract DI-14-34-0001-0278

Keywords: *Irrigation, *Water pumps, Aquifers, Design criteria, Performance evaluation, Economic analysis, *Wind power, Energy source.

An air compressor driven by a wind turbine can be used to operate an air lift water pump. In locations where a shallow aquifer yields a limited quantity of water per unit of time, it is a successful economical method of pumping water for the irrigation of a crop that does not have a critical period of water demand. The amount of submergence of the pumping unit is critical. The efficiency of the system increases as the submergence increases. The efficiency is also dependent upon the proper sizing of the eductor tube. The factors determining the size include submergence, pressure of compressed air, quantity of compressed air available, amount of water lift, and quantity of water required. The rate of air introduced to the eductor tube must be controlled for efficient operation.

PB83-220608/GAA PC **A09**/MF **A01**
Bechtel Group, Inc., San Francisco, CA.
Parametric Study of Seawater Reverse Osmosis Desalting Plants,
Randall Soo-Hoo, Sherman May, and Leon
Awerbuch. Jan 83, 193p W83-03316 , , OWRT-C-10141-D(1486)(1)
Contract DI-14-34-0001-1486

Keywords: *Desalination, Cost analysis, Membranes, Performance evaluation, Technology, Design criteria, Hollow fiber membranes, Spiral wound membranes.

A comprehensive parametric technical and economic study on seawater reverse osmosis desalination plants was conducted to derive updated costs for seawater reverse osmosis plants ranging in capacity from 1000,000 gpd to 5 million gpd at a Caribbean site and at a Continental U.S. site. The study considers hollow-fiver and spiral-wound membranes in one and two-pass configurations, various seawater intakes (surface, water well, Ranney collector), various high pressure pumping systems (centrigugal, positive displacement), optional energy recovery systems (Pelton wheel, reverse-running pumps, flow work exchanger), and operation and maintenance labor requirements. Process flow diagrams, piping and instrumentation diagrams, material lists, and plant layout diagrams were developed. Conceptual capital and operating cost estimates were prepared for the various base and parametric case plants to determine the product water costs.

PB83-221077/GAA PC **A12**/MF **A01**
Comision Economica para America Latina, Port of Spain (Trinidad and Tobago). Office for the Caribbean.
Caribbean Information System for Economic and Social Planning (CARISPLAN) Abstracts.
1982, 264p CEPAL/CARIB-82/12
Text in English and Spanish.

Keywords: *Information systems, *Information sources, *Caribbean, Developing countries, *Economic development, Socioeconomic status, Policies, Planning, Evaluation, Developing country application.

The objective of CARISPLAN is to facilitate Caribbean development and cooperation activities and to provide a relevant and up-to-date information service to policymakers, planners of socio-economic development projects and programs, managers of such projects and programs, researchers and teachers of development planning, financiers who provide resources and technical assistance, communicators of information about these programs, and library and information personnel. This bibliography contains the bibliographic information and an abstract of 198 reports divided into the following categories: Facts, Trends, and Analyses; Prescriptions for Decision-Making; Official Policies, Plans, Programs, and Arrangements; Development Action - Operational Experience; Consequences and Evaluation; and Resources and Tools for Development. For easy access to the information, the bibliography contains a subject index in English, Spanish, and French; a geographic index in English, Spanish, and French; an author index; a conference index; and a symbol index.

PB83-221549/GAA PC **A07**/MF **A01**
Instituto de Investigacion Agropecuaria de Panama, El Dorado.
Desarrollando Tecnologia Apropiada para el Agricultor. Informe de Progreso del Programa de Caisan en Panama (Developing Appropriate Technology for Agriculture: Progress Report of the Caisan Program in Panama).
Special studies no. 1,
Jose Roman Arauz, and Juan Carlos Martinez. Feb 83, 136p
Text in Spanish.Color illustrations reproduced in black and white.

Keywords: *Corn, *Soil erosion, *Farming, *Panama, *Herbicides, Erosion control, Planting, Yield, Cultivation, Developing country application, Atrazine.

The report presents the results of three years of research on maize (corn) in Caisan, Chiriqui Province, Panama. It describes the methodology used and emphasizes the success obtained in this short period. Among the technological components studied, it concludes that the pre-emergent herbicide Atrazine is effective in fighting weeds, that fertilization is not a limiting factor of production, and that the system of zero plowing facilitates sowing and is a valid method for reducing erosion and the cost of soil preparation.

PB83-223057/GAA PC **A03**/MF **A01**
Fairleigh Dickinson Univ., Teaneck, NJ. Coll. of Science and Engineering.
Center for the Transfer of Desalination Technology.
Final rept. 30 Sep 78-31 Aug 81,
Robert Bakish, and Wallace Arthur. Jun 83, 47p
W83-03352, , OWRT-C-00101-D(0447)(1)
Contract DI-14-34-0001-0447

Keywords: *Desalination, Technology, *Economic analysis, Brackish water, Sea water, Electrodialysis, Personnel development, Chlorination, Specialized training, Reverse osmosis desalination, Saint Croix(Virgin Islands).

The Center was established at the Fairleigh Dickinson University, West Indies Laboratory, St. Croix, U.S. Virgin Islands. The main purpose was to demonstrate both the technical and economic merits of desalination to industry and the public at large. Primary emphasis was given to seawater desalting by reverse osmosis and brackish water conversion by electrodialysis. Research was conducted on pretreatment of raw seawater without employing acid and with a chlorine starvation technique. In addition, operators and engineers received hands-on training as the Center was used for both credit and non-credit educational courses.

PB83-223891/GAA PC**$23.50**/MF**$23.50**
Intermediate Technology Development Group, London (England).
Construccion Manual de Pozos (Hand Dug Wells and Their Construction),
S. B. Watt, and W. E. Wood. c1977, 253p
Text in Spanish. See also PB-297 373.

Keywords: *Water wells, *Construction, Manuals, Public health, Design, Size determination, Construction materials, Cost effectiveness, Sanitation, Excavation, Disinfection, Developing country application.

This book presents a range of technology suitable for exploiting ground water sources at low cost, with minimum sophisticated technology and with the greatest input of village labor skills. The methods described combine traditional principles with modern techniques.

PB83-224147/GAA PC **E03**/MF **E03**
Norges Tekniske Hoegskole, Trondheim. Selskapet for Industriell og Teknisk Forskning.
Method to Estimate Equipment Cost in Automatic Assembly System,
Einar Ramsli. May 83, 10p STF17-A83020

Keywords: *Technology assessment, *Economic analysis, Automation, Reprints.

The authors have developed a method to evaluate different assembly systems. This method takes in consideration many criteria that have an influence on equipment cost. The criteria are such as weight, size, delivery condition etc. The system has been tested with the same product on several people with different skill levels in automated assembly.

PB83-224303/GAA PC **A06**/MF **A01**
Centro para el Desarrollo Tecnologico Industrial, Madrid (Spain).
Medicion de las Actividades Cientificas y Tecnicas (Measurement of Scientific and Technical Activities).
1980, 117p
Text in Spanish. Sponsored in part by Organization for Economic Co-Operation and Development, Paris (France).

Keywords: *Research and development, *Technology assessment, *Management techniques, Technology, Personnel, Policies, Objectives, Financing, Developing country application.

This report is essentially a technical work which explains the utilization of research and development (R&D) data, the relationship between the FRASCATI Manual and other international norms, and in general seeks to clarify standards and procedures for measuring R&D activities. Its chapters are devoted to: Objectives and themes of the manual; definitions and basic agreements; institutional classifications (private, public, non profit, higher education, and foreign); funcional distributions (type of activity, product groups, science and technology, and socioeconomic objectives); personnel evaluation and costs dedicated to R&D; methods for statistical studies; deflationary factors and types of exchange in R&D; and socioeconomic objectives of public financing for R&D.

PB83-224378/GAA PC **A05**/MF **A01**
Centro para el Desarrollo Tecnologico Industrial, Madrid (Spain).
La Conversion Fotovoltaica de la Energia Solar (Photovoltaic Conversion of Solar Energy),
Pedro Pezuela, and Fernando Ruedo. Apr 81, 77p CDTI-3
Text in Spanish.Color illustrations reproduced in black and white.

Keywords: *Photovotaic power system, *Solar energy, Solar cells, Performance evaluation, Cost analysis, Spain, Photovotaic cells, Solar concentrators, Developing country application.

The volume outlines the principles, techniques, and possibilities of solar energy use through photovoltaic conversion, and also develops a strategy for the future, which may help to improve Spain's energy situation. The document covers the main components of a photovoltaic system, cells and panels, energy storage, batteries, remote uses, cost problems, marketing possibilities, solar energy activities in other countries, and the future of solar energy. The annex includes techniques of materials production; thin film crystalline and amorphous cells; monocrystalline, polycrystalline, and metallurgical silicone cells; CdS/Cu2S cells; concentrators; and the availability of silicon.

PB83-224527/GAA MF**$9.00**
Intermediate Technology Publications Ltd., London (England).
Small Building Contractor and the Client: How to Run Your Business Successfully,
Derek Miles. c1980, 272p ISBN-0-903031-67-1

Keywords: *Construction, *Management techniques, Bids, *Buildings, Marketing, Risk, Purchasing, Law(Jurisprudence), Developing country application.

This report deals with the management of the building construction firm in relation to the various suppliers and persons he will have to contact to get his building contracts, as well as bidding to obtain his contracts. It examines the most economical ways to get his materials and budgets considering his costs for the main plant as well as the supervision of the construction site. The management of personnel, samples of letters, bills, meetings, and other managerial aspects of the business such as insurance and the drawing of bids are considered.

PB83-224592/GAA PC **A04**/MF **A01**
Centro para el Desarrollo Tecnologico Industrial, Madrid (Spain).
La Innovacion Industrial y las Relaciones Industria-Universidad (Industrial Innovation and Industry-University Relations).
May 80, 74p CDTI-1
Text in Spanish.

Keywords: *Technology assessment, *Technology transfer, *Economic analysis, *Spain, Developing countries, Policies, Universities, Developing country application.

After pointing out how precarious the status of the economy is in Spain, this report indicates that the main factor for the development of a country resides in its industrial innovation, for the economic and social progress of its people. The complexity of the means to develop Industrial Technology in Spain made it necessary to study ways to attack this problem. The basic document includes monographic studies on: General policy on patents; general policy on royalties; the same innovation problems faced and solved by other countries; exploitation of university centers to generate needed technology.

PB83-224600/GAA PC **A04**/MF **A01**
Centro para el Desarrollo Tecnologico Industrial, Madrid (Spain).
La Innovacion Industrial y su Tratamiento Fiscal (Industrial Innovation and Its Fiscal Treatment).
Oct 80, 61p CDTI-2
Text in Spanish.

Keywords: *Technology transfer, *Industrial development, Investments, Fiscal policies, Taxes, *Research and development, Developing country application.

This report emphasizes the importance of research for economic progress. After explaining the systems of other countries, it analyzes the present fiscal system of Spain to promote industry investment in research and development (R&D), obtain appropriate technology; help in the transfer of technology; try to increase the sources of funds for R&D; and export national technology. This document examines Spain's present legislation, its past history, the need to define the concept of R&D, and the difficulty for entrepreneurs to evaluate the fiscal incentives to decide about their investments. Separate chapters are devoted to fiscal incentive mechanisms for contractor investment in R&D, efficiency from technology transfer, fiscal treatment of donations or subsidies to encourage R&D, fiscal incentives of a subjective character, fiscal treatment of investments in study or research, fiscal taxes for technology transfer, financial incentives, and guidelines for fiscal and financial treatment of investment in R&D.

PB83-225011/GAA PC **A08**/MF **A01**
Fondo Colombiano de Investigaciones Cientificas y Proyectos Especiales, Bogota.
Tecnologia Appropiada en Educacion (Appropriate Technology in Education),
Gerardo Bacalini, Gladys Bottaro Marques, Vicky Colbert de Arbodeda, Jose Malayasi, and David Sanchez Juliao. Feb 79, 169p
Text in Spanish.

Keywords: *Education, *Technology transfer, Developing countries, Communities, Citizen participation, Resources, Developing country application.

This report is the final report of an international seminar on appropriate technology in education held in Bogota, Colombia, from January 29 to February 2, 1979. The purpose of the seminar was to validate the concept of appropriate technology in education (ATE); to determine its function in developing societies; and to determine possible strategies of sub-regional, regional, and international action to promote ATE. The introduction introduces the concepts and participants, and the second section covers the conceptual contents of the seminar. The third section covers the scheme of analysis for case studies of ATE presented in the seminar, including such ideas as community participation, non-formal education, educational resources used for ATE, and possibilities for replicating successful cases. The fourth section presents the participants papers on 11 case studies. The fifth section presents the recommendations and conclusions of the seminar, which are basically that ATE is a valid concept, and that further studies are needed on it to ensure its successful application throughout the world.

PB83-225136/GAA PC **A03**/MF **A01**
Centro para el Desarrollo Tecnologico Industrial, Madrid (Spain).
Que es la Innovacion Tecnologica (What is Technological Innovation),
Mario Albornoz Diez-Rodriguez. Jan 82, 42p CDTI-6
Text in Spanish.

Keywords: *Research and development, *Technology transfer, *Management techniques, Management, Econometrics, Policies, Spain, Developing country application.

This document has a theoretic approach, and there are few concrete references to the Spanish reality. Technical innovation is studied in light of the classical approach, neoclassical theory, marxist theory, Schumpeter's contribution, current econometrics, and literature on management. Other chapters deal with the technological aspect, including know-how and research and development policy to stimulate technological change.

PB83-225144/GAA PC **A05**/MF **A01**
Centro para el Desarrollo Tecnologico Industrial, Madrid (Spain).
La Ingenieria Genetica en la Biotecnologia (Genetic Engineering in Biotechnology),
Carlos Alonso Bedate, Julio Coll Morales, and Eugenio Herranz Lopez. Sep 81, 79p CDTI-4
Text in Spanish.

Keywords: *Health, *Spain, Economic development, Risks, Deoxyribonucleic acid, Developing country application.

The objective of this book is to encourage the use of genetic engineering for economic development. The report covers: (1) Precedents of genetic engineering; (2) a brief description of the technology, including the transfer of DNA in bacteria (vectors, E. coli and B. subtilis hosts, stages, and technical problems), practical examples of techniques used and their products (interferon; growth hormone; insulin; treatment of blood cells, Talasemia, and Lesch-Nyhan syndrome; and more nutritious soya), transfer to higher organisms, and cellular fusion; (3) biological risks and precautions; (4) possible applications (production of hydrogen, hydrocarbons, alcohol, chemicals, enzymes, peptides, viral antigens, monoclonal antibodies, genes, proteins, and insecticides; metal extraction; nitrogen fixation; biodegradation; and new varieties of plants and animals; and (5) international activities.

PB83-225821/GAA PC **A04**/MF **A01**
Centro para el Desarrollo Tecnologico Industrial, Madrid (Spain).
Innovacion Industrial y Sistema Educativo (Industrial Innovation and the Education System),
Mario Albornoz Diez-Rodriguez, Isabel Castro Ballesteros, and Manuel Sanchez Alonso. Oct 81, 66p CDTI-5
Text in Spanish.

Keywords: *Training, *Industrial development, *Education, Policies, Employment, Unemployment, Objectives, Resources, Spain, Developing country application.

This document addresses the need to integrate education into a policy of stimulation of innovation, train human resources to create a cultural base favorable to innovation, use innovation to combat unemployment, and adopt a concept of continuing education. It studies the modern postindustrial society, the strategic value of innovation, innovation as an educational end, innovative pedagogic theories and methods, innovation as an educative goal--taxonomy and typology from grade school through the university, the role of the professor, and innovation as a policy of the Education Administration.

PB83-226084/GAA PC **A05**/MF **A01**
Centro para el Desarrollo Tecnologico Industrial, Madrid (Spain).
La Telematica (Telematics).
Apr 82, 83p CDTI-7
Text in Spanish.Color illustrations reproduced in black and white.

Keywords: *Telecommunications, *Information systems, Developing countries, Communicating, Data processing equipment, Computer systems programs, Industries, Developing country application.

Telematics is a new discipline incorporating telecommunications and informatics. This report covers telematic's (1) technological perspectives (microelectronics, terminals, software, and voice communications); (2) Telematic systems (the electronic office, electronic mail, telex, teletext, videotext, facsimiles, data banks, teleconferencing, electronic funds transfers, security, and social and domestic applications); (3) social implications of telematics (political, economic, educational, and labor); (4) the state of marketing of telematics in principal developed countries; (5) strategies for the development of the telematics industry; and (7) evaluation of industry opportunity.

PB83-226407/GAA PC **A09**/MF **A01**
Auburn Univ., AL. Dept. of Fisheries and Allied Aquacultures.
Major Aquaculture Associations, Education and Research Resources in the United States.
Bibliographies and literature of agriculture (Final).
Jun 83, 189p BLA-26
See also PB83-176388.

Keywords: *Aquaculture, *Technical assistance, *Education, Personnel, States(United States), Financing.

The report identifies major educational and technical assistance organizations as well as associations working with aquaculture in the United States. The directory provides a convenient method of locating facilities, organizations, study opportunities, and resource people in the field of aquaculture.

PB83-226464/GAA PC **A03**/MF **A01**
Costa Rica Univ., San Jose. Inst. de Investigaciones en Ciencias Economicas.
Vivienda y el Proceso de Desarrollo: Un Problema Estructural (Housing and the Process of Development: A Structural Problem),
Denis Melendez H. Feb 81, 26p 22
Text in Spanish.

Keywords: *Housing, Sociology, Government, Economic development, Health, Urban areas, Rural areas, Urbanization, Local government, Allocations, Financing, Developing country application.

This report analyzes the contribution of housing to development as opposed to other infrastructural investments. Adequate housing promotes health and provides other benefits to a developing country. The report covers the effects of investment in housing on economic development, the high cost of housing versus the low level of income, structural incapacity to finance and construct necessary housing in volume, the urban-rural disequilibrium and its implications in urbanization, sociocultural and political administrative limitations, planning of investment and allocation of resources for housing and physical infrastructure, and formulae to determine when investment in housing is cost effective. The conclusions of the report are: Any program of housing requires a study to determine its return to national development; the housing problem in developing countries is more a problem of lack of development than a problem of lack of housing; and the effect of housing programs on migration and its repercussions is important.

PB83-228684/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
UNIDO's (United Nations Industrial Development Organization's) Industrial and Technological Information Bank (INTIB) and National Industrial Information and Advisory Services with a Problem Identification and Information Extension Function as an Interrelated System of Services to Industry in Developing Countries,
Kjeld Klintoe, and Roch T. de Mautort. Mar 82, 44p UNIDO/IS.325, 82-28195

Keywords: *Information systems, *Information services, *Technology transfer, Financing, Economic intelligence, *Industrial development, Developing country application.

UNIDO is engaged in promoting the flow towards developing countries under the related aspects of advising governments on the integration of industrial and technical information in their industrial development policies. UNIDO has created INTIB, its Industrial and Technological Information Bank, to identify and solve industrial development problems. This report combines three reports to UNIDO on this effort. Their titles are: The Small and Medium Industrial Enterprises and Technological Information Services - Concepts, Insights, and Experiences; Ambivalence of Technological Information; and INTIB for Industrial Development - The UNIDO Approach to Industrial and Technological Information.

PB83-228700/GAA PC **E05**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Papers from the Expert Group Meeting on the Implications of Technological Advances in Lighter than Air Craft: Technology,
Anthony J. Dolman, Henry A. Grieco, and Norman J. Mayer. Mar 82, 95p

Keywords: *Air transportation, *Technology assessment, Balloons, Inflatable structures, Helium, Ground support equipment, Technology transfer, Developing country application, Aerostats.

The report covers definition of essential concepts, main distinctions used in classifying airship types, history of important LTA developments from the first use of the balloon in the 18th century up to the late 1950s, experience gained in this period, theoretical work on airship development after 1945, discussions of the possible range of applications of LTA technologies and of development programs, and possible relevance in LTA technologys for developing countries.

PB83-228718/GAA PC **E05**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Papers from the Expert Group Meeting on the Implications of Technological Advances in Lighter than Air Craft for Developing Countries: Applications of the Technology,
G. Cahn Hidalgo, R. L. Ashford, B. B. Levitt, F. R. Nebiker, and H. K. Rappoport. 1982, 98p

Keywords: *Air transportation, *Technology assessment, Balloons, Inflatable structures, Helium, Ground support equipment, Technology transfer, Developing country application, Aerostats.

This UNIDO publication on LTA airships technology of potential use in developing countries surveys and assesses emerging technology innovations and their implications for industrial development, with special reference to airship types and systems most appropriate to conditions in developing countries. It covers categorization of LTA platforms: balloons; conventional airships; hybrid airships; tethered aerostats; remotely piloted aerostats, and appropriate LTA platforms. Considerations in LTA operations: such as use and availability of helium, ground support equipment, all-weather capabilities, and technology transfer are described.

PB83-228726/GAA PC **E08**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Chinese Experiences in Small Mini Hydro Power Generation.
2 Feb 82, 174p UNIDO/IS.284, 82-21244

Keywords: *Hydroelectric power, *Research and development, Rivers, Design, Economic analysis, Hydrology, Hydraulic turbines, China, Training, Energy policy, Developing country application.

UNIDO pub on experience in mini-hydroelectric power generation (MHG) in China - covers (1) hydro-power resources; river development and construction of MHGs; social aspects, economic aspects, planning, implementation and operation of MHGs (2) policies and measures; economic analysis; comparison with other energy sources (3) engineering design; hydrology; floods (4) water energy (5) turbines, machinery and equipment (6) research, choice of technology, prestressed concrete pipes, valves; innovation; MHG personnel training; costs reduction; dams. Statistics, diagrams, illustrations.

PB83-228759/GAA PC **E06**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Structural Changes in Industry.
1981, 105p UNIDO-ID/266-EN
See also Spanish version, PB83-228767, and French version, PB83-228775.

Keywords: *Natural resources, Economics, Policies, Cooperation, Employment, Investments, Commerce, *Industrial development, Developing country application.

The report presents an overview of relevant UNIDO research programmes and highlights main issues relating to industrial redeployment and restructuring. It also formulates proposals for action by individual developed countries and developing countries and by international organizations and covers cooperation, industrial policy, least developed countries, foreign investment, TCDC, technology transfer, employment policy, investment policy and trade policy.

PB83-228767/GAA PC **E06**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Cambios Estructurales en la Industria (Structural Changes in Industry).
1981, 116p UNIDO-ID/266-SP
Text in Spanish. See also English version, PB83-228759, and French version, PB83-228775.

Keywords: Economics, *Natural resources, Policies, Cooperation, Employment, Investments, Commerce, Developing country application, *Industrial development.

The report presents an overview of relevant UNIDO research programs and highlights main issues relating to industrial redeployment and restructuring. This report also formulates proposals for action by individual developed countries and developing countries and by international organizations and covers cooperation, industrial policy, least developed countries, foreign investment, TCDC, technology transfer, employment policy, investment policy and trade policy.

PB83-228775/GAA PC **E06**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
L'Evolution des Structures dans l'Industrie (Structural Changes in Industry).
1981, 116p UNIDO-ID/266-FR
Text in French. See also English version, PB83-228759, and Spanish version, PB83-228767.

Keywords: Economics, *Natural resources, Policies, Cooperation, Employment, Investments, Commerce, *Industrial development, Developing country application.

The report presents an overview of relevant UNIDO research programs and highlights main issues relating to industrial redeployment and restructuring. It also formulates proposals for action by individual developed countries and developing countries and by international organizations and covers cooperation, industrial policy, least developed countries, foreign investment, TCDC technology transfer, employment policy, investment policy, trade policy.

PB83-229286/GAA PC **E09**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Estrategia de Desarrollo Industrial en Bolivia (Industrial Development Strategy in Bolivia),
E. Espenhahn, O. Gonzalez-Hernandez, and T. Hutcheson. 1982, 181p UNIDO/IO.491, 82-21821
Text in Spanish.

Keywords: *Economic development, *Bolivia, Capital, *Employment, Productivity, *Industrial development, Developing country application.

This report deals with industrialization policys in Bolivia. It covers (1) structure and activities of the industrial sector; its economic implications; recent industrial growth; industrial enterprises, capital investment, employment, productivity; and the export and import of manufacturers.

PB83-229294/GAA PC **E07**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Preparatory Meeting of Directors of Industrial Development Finance Institutions on the Creation of a Technological Information Exchange Network Held at Bridgetown, Barbados, on 26-28 January 1982,
Emilio Capelo Recamonde, Alfredo Angel Echegaray, Siddharth S. Mehta, and James P. Blackledge. Feb 82, 147p

Keywords: *Information systems, *Industrial development, *Management techniques, Developing countries, Financing, Developing country application.

The reports in this document provide information on the various aspects of industrial development. They were presented to a meeting which recommended that a pilot industrial information network be set up to confidentially share useful information among members. This pilot network was then to be improved and expanded once it proved its usefulness. The data source envisaged, INTIB, has already been set up and is functioning as planned. The separate reports in this document are: The Meeting's Final Report; The Bank of North-East Brazil as a Financing Agent in the Process of the Industrial and Technological Development of its Area; The Latin American Association of Development Financing Institutions (ALIDE) and the Industrial Development Finance Institutions (IDFI) Technological Information Exchange Network; Background Papers to be discussed for the establishment of the Technological Information Exchange Network and INTIB; Some Considerations on the Possibilities and Feasibility of the Establishment of the Technological Information Exchange Network for the Use of IDFI; and Technological Choice and Information Sources for Development Finance Institutions.

PB83-229302/GAA PC **E08**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Papers Submitted to a Meeting of Directors of Industrial Development Institutions on the Creation of a Technological Information Exchange Network, Barbados, 26-28 January 1982.
Jan 82, 152p

Keywords: *Information systems, *Technology transfer, Financing, Economic intelligence, *Industrial development, Developing country application.

These briefs were submitted by participants from Trinidad & Tobago, Barbados, Mexico, India, Mauritius, Egypt, Tanzania, Kenya, Malta, and a second one on Tanzania. The briefs contain information on their countries' industrial development financing activities; current experiences and methodology of evaluation of the technological contents of the industrial projects; information required for technological evaluation of the projects submitted for financing, and the existing gaps for obtaining such information; a brief outline proposal for a technological information exchange network including suggestions of the method of operation; and other suggestions to comply with and support the needs of project evaluation and technology choice, and on how industrial development financing institutions could contribute to strengthening the technological capabilities and capacities in the country.

PB83-229674/GAA PC **E06**/MF **E06**
Oxford Univ. (England). Commonwealth Forestry Inst.
Provenance Regions for 'Pinus caribaea' and 'Pinus oocarpa' Schiede Within the Republic of Honduras.
Tropical forestry papers,
A. M. J. Robbins, and C. E. Hughes. 1983, 102p
TFP-18
Prepared in cooperation with Escuela Nacional de Ciencias Forestales, Siguatepeque (Honduras).

Keywords: *Tropical regions, *Pine trees, *Honduras, Plant genetics, Selection, Seeds, Temperature, Soils, Vegetation, Geography, Morphology, Rainfall, Collecting methods, Great Britain.

Wherever a tree species has a natural distribution within which environmental conditions vary, it will probably show genetic variation correlated with site variation, due to the process of natural selection. If a forester wishes to use a species that has a widespread and/or discontinuous distribution, or which covers distinct site types, he should expect genetic differences between seed sources or provenances of that species. The most suitable provenance is likely to be that where environmental conditions of provenance and planting site match as nearly as possible. This at least ensures that the plantation will be well adapted to its site, and have characteristics of growth rate, form etc. similar to the natural parental stand. The delineation of these regions will be of practical value to the forester in several ways as described in the report.

PB83-230995/GAA PC **E11**/MF **E11**
Oxford Univ. (England). Commonwealth Forestry Inst.
'Pinus patula'.
Tropical forestry papers no. 7,
T. J. Wormald. 1975, 231p

Keywords: *Pine trees, *Tropical regions, *Forestry, Taxonomy, Sites, Soil fertility, Plant reproduction, Plant growth, Height, Wood, Plant genetics, Hybridization, Africa, Great Britain, Silviculture.

Pinus patula has now been planted as a commercial crop on a large scale in Africa for over thirty-five years. Its importance has been recognized by the publication in 1973, of an annotated bibliography by FAO, Rome. Some of the subject areas covered in the report are: Taxonomy, plant growth, fertilizers, plant reproduction, and wood properties.

PB83-231001/GAA PC **E06**/MF **E06**
Oxford Univ. (England). Commonwealth Forestry Inst.
Descriptions of Seed Sources and Collections for Provenances of 'Pinus caribaea'.
Tropical forestry papers no. 12,
A. Greaves. 1978, 108p
Errata sheet inserted.

Keywords: *Tropical regions, *Pine trees, Seeds, Growth, Climate, Field tests, Central America, Distribution(Property), Storage, Great Britain, Reprints.

The history of the use of Pinus caribaea as an exotic plantation species is given by Lamb (1973). The first introductions took place as early as 1929, but it was not until 1960 that a general interest in the species by many tropical countries developed. One consequence of this was that P. caribaea began to receive close attention. The results from the limited number of exotic trials in existence were promising. Moreover most of the natural populations of this species are found on degraded and infertile soils within the humid tropical lowlands. In September 1963 what is now the Unit of Tropical Silviculture (UTS) of the Commonwealth Forestry Institute (CFI), Oxford, began to compile information on the growth and yield of P. caribaea. From 1963 to 1969 seed was also acquired from a few known sources of the three varieties of P. caribaea now recognized and widely distributed for provenance trials.

PB83-231019/GAA PC **E04**/MF **E04**
Oxford Univ. (England). Commonwealth Forestry Inst.
Annotated Bibliography of Genetic Variation in 'Eucalyptus camaldulensis'.
Tropical forestry papers no. 8,
K. G. Eldridge. 1975, 66p

Keywords: *Tropical regions, *Forestry, Structural timber, Fuels, Poles(Supports), Wood products, Seeds, Plant reproduction, Supply(Economics), Africa, Mediterranean Sea Basin, Australia.

The purpose of this bibliography is to provide access to and to review information on the genetic resources of Eucalyptus camaldulensis, a tree of great importance in Mediterranean, subtropical and tropical countries. It is particularly important for the production of domestic products, such as poles, posts and timber, but above all, and increasingly, fuel wood. The references are confined to natural distribution, genetic variation, reproductive biology, tree breeding, seed supply and the related subjects listed in the Subject Index.

PB83-231027/GAA PC **E04**/MF **E04**
Oxford Univ. (England). Commonwealth Forestry Inst.
First Look at Agathis.
Tropical forestry papers no. 11,
T. C. Whitmore. 1977, 75p

Keywords: *Tropical regions, *Pine trees, *Forestry, Cultivation, Taxonomy, Plant genetics, Exploitation, Malaya, New Guinea, Fiji Islands, Great Britain, Reprints.

Agathis is a genus of some thirteen species of tall, coniferous, resinous trees, widely known as Kauri or Kauri Pine, from the Maori name of the New Zealand species A. australis. Knowledge of Agathis in cultivation and their response to silvicultural treatment is still fragmentary. This report on a whole genus is therefore much less comprehensive than those previous monographs in this Series which have dealt with single species of which there is far more experience.

PB83-231167/GAA PC **E05**/MF **E05**
Oxford Univ. (England). Commonwealth Forestry Inst.
'Terminalia ivorensis'.
Tropical forestry papers no. 5,
A. F. A. Lamb, and O. O. Ntima. Jan 71, 80p

Keywords: *Tropical regions, *Forestry, *West Africa, Elevation, Distribution(Property), Structural timber, Terminalia amazonia, Terminalia brassii.

The report is devoted to Terminalia ivorensis the well known West African timber tree which is now being extensively planted in the high forest type of the lowland tropics. There are several other members of this genus of the family Combretaceae which are being used in timber plantations by tropical silviculturists.

PB83-231530/GAA PC **E04**/MF **E01**
Transport and Road Research Lab., Crowthorne (England).
Preliminary Study of Children's Road-Crossing Knowledge in Three Developing Countries.
Supplementary rept.,
A. J. Downing, and I. A. Sayer. c1982, 26p TRRL-SR-771
Also pub. in ISSN-0305-1315.

Keywords: *Children, Behavior, Performance tests, Statistical analysis, Surveys.

Appropriate ways of advising and educating children in developing countries need to be developed, and this would be aided considerably by more detailed information on children's existing knowledge and behaviour. Children, aged between 5 and 11 years, were interviewed and given a simulated road crossing test in a number of schools in Jamaica, Pakistan and Thailand to determine how much they knew about crossing roads and to find out which factors, if any, affected their knowledge. A comparison of the results with those of a UK study indicated that up to 57 percent fewer children in the 3 developing countries had received advice about crossing roads. Also fewer of them behaved correctly on the simulated crossing test in the 3 developing countries.

PB83-231878/GAA PC **E10**/MF **E10**
Oxford Univ. (England). Commonwealth Forestry Inst.
'Pinus kesiya' Royle ex Gordon (syn. P. 'khasya' Royle; P. 'insularis' Endlicher).
Tropical forestry papers,
F. B. Armitage, J. Burley, F. G. Browne, I. A. S. Gibson, and P. Guldager. 1980, 215p ISBN-0-85074-030-4, TFP-9
Also pub. in ISSN-0141-9668.

Keywords: *Tropical regions, *Pine trees, *Forestry, Taxonomy, *Ecology, Distribution(Property), Pest control, Plant diseases, South Africa, Great Britain.

This monograph is a synthesis of the published and certain unpublished information on the taxonomy, distribution, ecology, genetic variation, silviculture, pests, diseases and other injurious agencies, wood properties and major uses of P. kesiya and of progress in its improvement to date by breeding. Whilst attempting to place it in proper ecological and silvicultural perspective, we have also tried to indicate the directions for future development and improvement to ensure that the apparently great biological potential of the species can be exploited.

PB83-231886/GAA PC **E05**/MF **E05**
Oxford Univ. (England). Commonwealth Forestry Inst.
Manual of Permanent Plot Procedures for Tropical Rainforests.
Tropical forestry papers no. 14,
T. J. Synnott. 1979, 77p ISBN-0-85074-031-2
Also pub. in ISSN-0141-9668.

Keywords: *Tropical regions, *Forestry, Manuals, Recommendations, Growth, Yield, Inventories, Mathematical models, Great Britain.

The purpose of this manual is to describe and recommend some of the most useful methods and techniques for permanent plots in indigenous, mixed tropical forests, for sample plots and for experimental and research plots. The first part of this manual deals particularly with sample plots and the second with silvicultural research plots. Commonwealth Forestry Institute provides a system for monitoring the stocking and development of the stand and its rate of production which allows any unexpected or unfavourable developments to be measured. It also provides the data essential for constructing yield tables and growth models which may be used, together with current inventory data, for growth and yield predictions.

PB83-231894/GAA PC **E08**/MF **E08**
Oxford Univ. (England). Commonwealth Forestry Inst.
Descriptions of Seed Sources and Collections for Provenances of 'Pinus oocarpa'.
Tropical forestry papers no. 13,
A. Greaves. 1979, 151p ISBN-0-85074-029-0
Also pub. in ISSN-0141-9668.

Keywords: *Tropical regions, *Pine trees, Seeds, Collecting methods, Distribution(Property), Foreign countries, Mexico, Guatemala, Nicaragua, Honduras, Tables(Data).

The Commonwealth Forestry Institute's continuing program of exploration and evaluation of the genetic resources of tropical tree species began with Pinus caribaea, which occurs naturally in the Bahamas, Cuba and the Central American lowlands. The report deals with this species. At higher and drier altitudes in Central America P. caribaea is associated with, and eventually replaced by Pinus oocarpa. P. oocarpa therefore appears to be useful species for extending the range of conditions in which plantations can be successfully established in other countries. The seed of the species is in increasing demand for plantation development, but many seed sources are untried and there is a need for range-wide provenance trials. Seed of 74 provenances of P. oocarpa has been collected and distributed for an international provenance trial in which 42 countries are participating.

PB83-231936/GAA PC **E04**/MF **E01**
Electricity Council Research Centre, Capenhurst (England).
Dye Fixation Using Radio Frequency Heating,
R. M. Perkin. Oct 82, 32p ECRC/M-1615

Keywords: *Textile industry, Performance evaluation, Temperatures, Cotton fibers, Nylon 66, Polyester fibers, Fixatives.

Experiments were carried out using radio frequency heating, rfh, to raise the temperature of fibres loaded with dye solution up to their fixation temperatures. The rate of fixation was determined by the temperature and moisture content of the fibres. Polyester was dyed at atmospheric pressure using rfh to reach its fixation temperature of about 160 C. Fixation of a reactive dye on cotton at 95 C was achieved without a reduction in depth of shade or perspiration fastness. It was concluded that, when compared with steam heating, the use of rfh speeds up the finishing process and, in some cases, enhances dye penetration.

PB83-232371/GAA PC **E04**/MF **E01**
Electricity Council Research Centre, Capenhurst (England).
Ventilation with Open Windows.
Final rept. Nov 78-Jun 79,
D. J. Dickson. Apr 80, 54p ECRC/M-1329

Keywords: *Houses, *Buildings, Windows, Air flow, Heat loss, Thermal insulation, Temperature distribution, Convection, Heat transfer.

Measurements were made of how the ventilation in two different, well insulated houses was affected by window opening. Specific factors investigated included: the amount by which the window was opened, wind strength and direction and the temperature difference between inside and outside. Leakage through the structure was found to provide most of the ventilation required. Comparisons were made of the relative contributions to ventilation rates of forced convection (wind) and natural convection.

PB83-232405/GAA PC **E08**/MF **E08**
Plastics and Rubber Inst., London (England).
Drive for Plastics. Proceedings of a Conference Drive for Plastics He at Hounslow (England) on 6-7 Oct 82.
Final rept.
1982, 151p

Keywords: *Automobiles,*Plastics, Automotive engineering, Composite materials, Automobile bodies, Automotive transmission, Automotive engines, Composite structures, Durability, Economic analysis, Quality control, Reinforced plastics.

The conference brought together design engineers, raw materials suppliers and specifiers from the plastics and automotive industries. Specific subjects dealt with included: use of plastics in engine components, especially in transmission; use of composite structures; and use of plastics in vehicle structures, including load-bearing structures. These topics were discussed from economic, quality control and durability viewpoints.

PB83-232504/GAA PC **E13**/MF **E13**
Oxford Univ. (England). Commonwealth Forestry Inst.
'Pinus caribaea'. Volume 1.
Tropical forestry papers no. 6,
A. F. A. Lamb. Oct 73, 308p

Keywords: *Pine trees, *Tropical regions, *Forestry, Taxonomy, Wood, Mechanical properties, Physical properties, Site selection, Measurement, Plant reproduction, Wood preservatives, Great Britain, Forest plantations, Silviculture.

Though this monograph is the sixth in the series 'Fast Growing Timber Trees of the Lowland Tropics' its compilation has been in progress for almost ten years. The continually expanding world interest in Pinus caribaea is yielding more and more research information both at Oxford and elsewhere, particularly on wood properties and tree improvement, and for this reason the monograph will be issued in three parts, of which this is the first.

PB83-232553/GAA PC **E04**/MF **E01**
Electricity Council Research Centre, Capenhurst (England).
Gas Porosity in Copper Alloy Sand Castings,
L. Smith. Jan 82, 26p ECRC/M-1425

Keywords: *Castings, Defects, Electric furnaces, Hydrogen embrittlement, Foundry sands, Pinholes, Nonferrous castings.

The report was prepared after an increased number of incidents were reported of porosity defects after the installation of electric melting furnaces. Types of porosity and sources of gas defects were reviewed. No evidence was found of hydrogen levels in electrically melted copper alloys sufficiently high enough to cause such defects. The hydrogen content was, however, found to increase rapidly after contact with green sand mould. This increase occurred during initial mould filling and thus was not strictly a metal-mould reaction. It was recommended that further defects should be well documented, with close examination of ancillary practices, housekeeping and records of scrap levels.

PB83-232900/GAA PC **E04**/MF **E01**
Transport and Road Research Lab., Crowthorne (England).
TRRL (Transport and Road Research Laboratory) Road Investment Model for Developing Countries (RTIM2).
Final rept.,
Linda L. Parsley, and R. Robinson. c1982, 54p TRRL-LR-1057
Also pub. in ISSN-0305-1293.

Keywords: *Roads, Rural areas, Paving, Computerized simulation, Investments, Mathematical models, Cost engineering, Maintenance, Operations research, RTIM2 computer program.

As rural and inter-urban roads represent a large part of national development programs in developing countries, information on road investment was built into a computer model to improve the quality of investment decisions. The model permitted a study of: connections between road design and construction standards; road maintenance policy, vehicle characteristics, traffic flow and growth rate; environment and road deterioration; choice of earth, gravel or bituminous pavement; different stage construction options; and consequences of uncertainties in traffic forecasts or in the discount rate to be studied. The program is in standard FORTRAN, consists of 6000 statements and requires input in card image form.

PB83-233163/GAA PC **E04**/MF **E01**
Transport and Road Research Lab., Crowthorne (England).
Study of Bus Safety in Delhi.
Final rept. Apr 78-Apr 80,
G. D. Jacobs, and A. J. Downing. c1982, 28p TRRL-SUPPLEMENTARY-758
Also pub. in ISSN-0305-1315.

Keywords: *Buses(Vehicles), Developing countries, Motor vehicle operators, Accident investigations, Surveys, Traffic safety, Safety engineering, India, Accident studies, Accident rates.

Public service vehicles in cities in developing countries are involved in a high proportion of road accidents and have very high fatality rates per million bus kilometres travelled per annum. This report analyses one year's accident records of the Delhi Transport Corporation (DTC) to identify the type of accident taking place, class of road user involved and factors affecting accident severity. 580 DTC bus drivers were interviewed to determine how far training, experience and working conditions affect accident rates. Over 200 DTC buses were surveyed to assess the affect that their general condition might have had on vehicle safety.

PB83-233585/GAA PC **E04**/MF **E04**
Cement and Concrete Association, Slough (England).
Rain and Air Penetration Performance of Concrete Blockwork.
Technical rept.,
A. J. Rathbone. c1982, 37p CCA/TR-553, ISBN-0-7210-1261-2
Also pub. in ISSN-0528-3701.

Keywords: *Concrete, Fluid infiltration, Permeability, Air, Water, Penetration tests.

A series of water and air penetration tests has been carried out on 31 panels of concrete blockwork and on individual blocks to compare the performance of different types and make of unit as well as construction methods. Graphs and tables have been produced which illustrate the superior performance of some types of wall, and tentative limits are proposed for the amounts of air and water penetration which would exclude the use of certain blocks, built as the outer leaf of a cavity wall, in areas of severe exposure. It was, however, found that no simple relationship exists between unit and wall performance.

PB83-233775/GAA PC **E13**/MF **E13**
Oxford Univ. (England). Commonwealth Forestry Inst.
Manual Sobre Investigaciones de Especies y Procedencias con Referencia Especial a Los Tropicos (Manual on Species and Provenance Research with Particular Reference to the Tropics and Appendices).
Tropical forestry papers no. 10 and 10A,
J. Burley, and P. J. Wood. 1979, 314p TFP-10/10A
See also PB83-233783. Text in Spanish.

Keywords: *Tropical regions, *Forestry, Manuals, Field tests, Plant genetics, Forest trees, Sampling, Wood, Structures, Project planning, Laboratories, Tests, Developing countries.

Although aimed primarily at tropical countries, and especially those with limited research experience or facilities, this manual attempts to provide a comprehensive treatment of the principles and practices involved in testing species and provenances that are applicable under all forest plantation conditions. Throughout the manual the empirical rather than the academic approach is emphasized on the understanding that the primary aim of most afforestation programs is the growing of healthy, productive forests. Appendices cover: Sampling and data recording; Laboratory procedures; and the wood structure index approach.

PB83-233783/GAA PC **E13**/MF **E13**
Oxford Univ. (England). Commonwealth Forestry Inst.
Manual on Species with Provenance Research with Particular Reference to the Tropics.
Tropical forestry papers no. 10 and 10A,
J. Burley, and P. J. Wood. 1976, 301p TFP-10/10A
See also PB83-233775.

Keywords: *Tropical regions, *Forestry, Manuals, Production, Taxonomy, Plant genetics, Seeds, Site selection, Field tests, Experimental design, Planting, Wood, Quality control, Great Britain, Laboratories, Tests, Forest plantations.

Although aimed primarily at tropical countries, and especially those with limited research experience or facilities, this manual attempts to provide a comprehensive treatments of the principles and practices involved in testing species and provenances that are applicable under all forest plantation conditions. Throughout the manual the empirical rather than the academic approach is emphasized on the understanding that the primary aim of most afforestation programs is the growing of healty, productive forests. Appendices cover: Sampling and data recording; Laboratory procedures; and The wood structure index approach.

PB83-233791/GAA PC **A08**/MF **A01**
Empresa Catarinense de Pesquisa Agropecuaria S.A., Florianopolis (Brazil).
Hemarthria Resumos (Hemarthria Abstracts),
Fernando Adami Tcacenco, Lidia M. G. de Borba Bernhardt, and Carlos Alberto Miranda da Silveira.
Feb 83, 170p DOCUMENT-16
Text in English and Portuguese. Also pub. in ISSN-0100-8986.

Keywords: *Grass, *Tropical regions, Cultivation, Livestock, Animal nutrition, Survival, Tolerances(Physiology), Winter, Freezing, Abstracts, Vegetation, Yield, Developing country application.

This study is thought to be the most complete bibliography on the genus Hemarthria currently available. As well as a bibliography on Hemarthria, readers will find further relevant information on the cultivation regions of this forage grass and available world results. It can also be observed that the various citations confirm data and information given by agricultural researchers and farmers from several countries that Hemarthria is of significant importance as a forage grass and has great possibilities for use in animal feeding, especially during the unfavorable periods of the year.

PB83-233809/GAA PC **E05**/MF **E05**
Radcliffe Science Library (England).
Theoretical Basis for the Representation of On-Line Computer Systems to Naive Users,
A. P. Jagodzinski. Aug 81, 79p RSL/ENG-673/12

Keywords: *Information systems, *Computers, Library science, Process control, User needs.

Computer naive users require a conceptual model of the computer system in order to form a clear idea of what the system is doing. This model can only be communicated to the user by the representation of the system which appears at his terminal. The designer of an on-line system must therefore include the user, as well as the terminal, within the boundaries of the system. In order to derive a theoretical basis for design standards. current theory and practice in psychology, computer science and process control were examined, and a consensus for the design of representations suitable for describing the operations of on-line computer systems via their terminal interfaces was sought. The theory was applied to the example of a library serials control system.

PB83-235341/GAA PC **E06**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Appropriate Industrial Technology for Basic Industries.
Monographs on appropriate industrial technology no. 13,
K. H. Yap, B. R. Nijhawan, R. K. Iyengar, S. Ramachandran, and S. M. Patil. 1981, 104p

Keywords: *Machine tools, *Industrial plants, *Technology assessment, Plant location, Machine tool industry, Iron and steel industry, Chemical industry, Fertilizers, Developing country application.

This publication contains the following reports: Issues and considerations; Basic materials industries - aspects of technology choice and industrial location; choice and adaptation of alternative technology for the iron and steel industry; appropriate technology for the iron and steel industry; appropriate technology for the capital goods industry (machine tools) in developing countries; the role of the engineering industry; appropriate technology for the chemical industry; technology for oil and gas based industries - the case of Kuwait; and the fertilizer industry in India. A bibliography is also included.

PB83-235358/GAA PC **E05**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Metal Production Development Units.
Development and transfer of technology series no. 16.
1982, 80p

Keywords: *Metals, Industrial engineering, Production management, Capital, Market surveys, Developing countries, Metal products, Developing country application.

A Metal Production Development Unit is a prototype facility to help developing countries create the capacity to produce, as well as adapt and eventually substitute imported metal products, components, and spare parts; provide tools and molds for metal transforming operations; assist in creating the materials required for metalworking machinery construction; and establish the base for a capital industry. The MPDU has been conceived to reduce the level of economy of scale for the production of metal products, components, or spare parts to suit the requirements of the country. This publication can be used by planners and decision makers to assess the priority a MPDU project should have in their country's development plans, and then in preparing a technical implementation plan based on a technical market survey, which would then be elaborated flexibly to be able to respond to the needs of the future.

PB83-235366/GAA PC **E12**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Analysis of Machinery for the Food-Processing Industry.
14 Apr 81, 289p UNIDO/IS.221, 81-24139
Prepared in cooperation with Emppesa Nacional de Ingenieria y Tecnologia, S.A.

Keywords: *Food processing, *Power equipment, *Technology transfer, Meat, Dairy products, Technology transfer, Beverages, Developing countries, Infrastructure, Developing country application.

This is an expert report on machinery for the food industry. It covers general characteristics of the industry; capital goods for the dairy products industry, meat industry, fruit and vegetables, cereals, fish, sugar, preserving, compound feeds, oils and fats, and the beverage industry including coffee; types of capital goods; choice of technology; the industrial infrastructure required and machinery production and related foreign trade; technology transfer including statistics and a list of suppliers; and additional references.

PB83-236984/GAA PC **A04**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Needs in Science and Technology for Development in Caribbean Island Nations - Report of a Workshop Held in Washington, DC. August 30-31, 1982.
1983, 66p

Keywords: *Economic development, *Caribbean, *Technology transfer, Meetings, Fisheries, Agriculture, *Energy source development, Industrial technology.

The Reagan administration and Congress have recently emphasized the potential of the Caribbean Basin as a special site for an economic recovery program. The nations of the Caribbean are relatively small in size and population. Most lack natural resources and are dependent on the production of a few basic commodities. Although much attention has been devoted to evaluating economic factors in the region, the United States has done no detailed study of the aspects of science and technology most needed for the support of Caribbean development, nor of the role science and technology might play in assisting the region to increase the rate of economic development. This report details the results of a workshop held for the purposes of identifying these scientific and technological needs.

PB83-239939/GAA PC **A16**/MF **A01**
Office of Technology Assessment, Washington, DC.
Technologies and Management Strategies for Hazardous Waste Control. Volume 2. Working Papers. Part A. Hazardous Waste Categories: Review of Literature and Past Research Effort.
Apr 83, 361p*
See also Part B, PB83-239947 and PB83-189241.
Also available in set of 4 reports PC E99, PB83-239921.

Keywords: *Waste treatment, *Management planning, Technology, Regulations, Solid waste disposal, State government, Classifying, Toxicity, Resource conservation and recovery act, Ranking.

This volume contains papers written for OTA to assist in preparation of the report TECHNOLOGIES AND MANAGEMENT STRATEGIES FOR HAZARDOUS WASTE CONTROL. The contents include Hazardous waste categories, a review of literature and past research effort.

PB83-240895/GAA PC **A03**/MF **A01**
Ardhi Inst., Dar es Salaam (Tanzania).
Upgrading Squatter Housing in Dar es Salaam.
L. M. Masembejo, and N. J. W. Tumsiph. Dec 81, 39p ISBN-91-540-9117-9
Also pub. in ISSN-0347-4348. Sponsored in part by National Swedish Inst. for Building Research, Stockholm.

Keywords: *Housing, *Urban planning, *Tanzania, Low income groups, Government policies, Urban development, Developing country application.

This publication includes two separate papers, both dealing with the squatter upgrading and sites and services project in Dar es Salaam, Tanzania. The papers are based on studies carried out in 1979 and 1980 when the authors were students at the Ardhi Institute in Dar es Salaam. The situation in the squatter areas and the upgrading project are described. From a perspective of broad policy objectives they discuss various components of the project. The missing of the target group in the resettlement part of the projects is subjected to criticism and related to procedures of plot allocation, building permits, loans, etc. The authors also contribute with positive proposals to overcome shortcomings.

PB83-241018/GAA PC **A03**/MF **A01**
Rutgers - The State Univ., New Brunswick, NJ.
Standardized Procedures for Planting Vegetation on Completed Sanitary Landfills.
Final rept.,
Edward Gilman, Franklin Flower, and Ida Leone. Jul 83, 47p EPA-600/2-83-055
Contract EPA-R-807673

Keywords: *Grass, *Agriculture, *Sanitation, *Environmental management, Manuals, Financing, Selection, Soil fertility, Spreading, Depth, Sampling, Grasses, Leguminous plants, Metals, Fertilizers, Tolerances(Physiology), Methane, Carbon dioxide, Extraction, Hazardous materials.

A manual was developed for those charged with establishing a vegetative cover on completed landfills. Special problems associated with growing plants on these sites are discussed, and step-by-step procedures are given for converting a closed landfill to a variety of end uses requiring a vegetative cover. Instructions are given for vegetating landfills with either limited or adequate funds. A hypothetical case of landfill conversion is also included.

PB83-241653/GAA PC **A04**/MF **A01**
National Bureau of Standards, Washington, DC. National Measurement Lab.
Evaluation Criteria for Comparing Domestic and Foreign Material Specifications.
Final rept.,
J. G. Early. May 83, 53p
Sponsored in part by Coast Guard, Washington, DC.

Keywords: *Metals, Comparison, Mechanical properties, Chemical composition, Standards, Evaluation.

Consistent decisions on the degree of equivalency between metal specifications of different national origins cannot be made only on the basis of chemical composition and direct comparison of mechanical property numbers. There are numerous additional factors, including metallurgical effects, product form effects, test acceptance criteria, and differences in specification philosophy, which if present, may influence the determination of equivalency because of their effect on property requirements. In order to remove the uncertainty in this decision-making process, these additional factors must be evaluated for each comparison.

PB83-242255/GAA PC **A02**/MF **A01**
Southern Forest Experiment Station, New Orleans, LA.
Sales and Distribution Channels for Exporting Southern Forest Products.
Forest Service research paper,
Richard W. Guldin. Jul 83, 15p FSRP-SO-192

Keywords: *Wood products, *Marketing, Sales, Lumber, Exports, Control, Decision making, Feasibility.

The key elements which small- to medium-sized southern forest product firms should consider when estimating the export potential for their products are identified in the report.

PB83-244046/GAA PC **A14**/MF **A01**
AiResearch Mfg. Co. of California, Torrance

High-Temperature Ceramic Recuperator and Combustion Air Burner Programs.
Annual rept. Apr 82-Mar 83,
M. Coombs, and D. Strumpf. Apr 83, 315p 83-19870, GRI-83/0006
Contracts GRI-5080-342-0440, GRI-5080-342-0439
See also PB83-216788.

Keywords: *Ceramics, Heat exchangers, *Burners, Design, Evaluation, *Waste heat utilization.

The report describes the second-year effort of a 3-year program for the development of a ceramic recuperator and its companion high-temperature preheated combustion air burner. The system is designed to operate in a variety of industrial flue gas streams with exhaust temperatures up to 2500F. The ceramic recuperator provides up to 2000F preheated combustion air to the high-temperature burner. Under anticipated conditions, fuel savings of up to 50 percent are achieved when compared to unrecuperated furnaces.

PB83-244558/GAA PC **E04**/MF **E01**
Osaka Municipal Urban Engineering Information Center (Japan).
OSAKA and Its Technology, Number 1, 1982.
1982, 60p
See also PB83-244640.Color illustrations reproduced in black and white.

Keywords: *Urban planning, *Japan, *Environmental surveys, Engineering, Technology, Local government, Coordination, Transportation, Water quality, Muscidae, Land reclamation, Telemetry, Fire fighting, Solid waste disposal, Air pollution, Urban areas, Nitrogen oxides, Ecology.

The Osaka Municipal Urban Engineering Information Center was established in 1982 with the objective to collect, classify and exchange theses and technical information on urban engineering and technology for reference and to extend expert advice and cooperation in the execution of various engineering projects of local governments at home and abroad. The first issue of their publication contains a number of articles by experts in their respective fields. CONTENTS: Urban Transport and the Environment; A NOx Diffusion Model in an Urban Area and Its Application to the Urban Planning; New-Tram, The New Transportation System in South Port Area of Osaka; Road and Amenity; Revitalizing the Central District of the City; Ground Improvement Technique for a Vast Reclaimed Land by Combination of Vertical Drains and Dewatering; Study on Ecology and Control of Housefly at a Waste Disposal Site; Continuous Water Quality Monitoring System using Telemetry and Establishment of Automatic Measuring Method; and Computer-aided Command and Control System for Fire-Fighting and Ambulance Services.

PB83-244657/GAA PC **E04**/MF **E01**
Osaka Municipal Urban Engineering Information Center (Japan).
OSAKA and Its Technology, Number 3, 1983.
1983, 73p
See also PB83-244640 and PB83-244558.Color illustrations reproduced in black and white.

Keywords: *Urban planning, *Japan, Sewers, Construction, Sludge drying, Activated sludge treatment, Odors, Removal, Breakwaters, Dikes, Water waves, Dispersing, Solidification, Nitrogen dioxide, Concentration(Composition), Solidification, Air pollution, Exhaust emissions, *Waste recycling.

The Osaka Municipal Urban Engineering Information Center was established in 1982 with the objective to collect, classify and exchange theses and technical information on urban engineering and technology. This issue contains the following articles: Urban Development Strategy for Osaka City; Construction of Abeno Station on the Tanimachi Line of Osaka Municipal Subway Using the Shield Method; Construction of Tennoji-Benten Trunk Sewer; SIL-B Process- A new Method for the Solidification Treatment of Sludge; Studies on Deodorization by Activated Sludge; Estimation of Long-Term Average Concentration of NO sub 2 in Areas Adjacent to Trunk Roads; Development of a Soil Waste Recycling Plant and its System; and Upright Wave-dissipation Caisoon-Type Breakwaters and Dikes.

PB83-245308/GAA PC **A07**/MF **A01**
California State Div. of Mass Transportation, Sacramento.
SB 283 (1975) Innovative Public Transportation Demonstration Program: Synopses of Project Evaluations.
Final rept.,
Al Hollinden. Mar 83, 135p DMT-115, UMTA-CA/MT-83/115
Grant DOT-UMTA-CA-09-8005/6
Prepared in cooperation with California Univ., Irvine. Inst. of Transportation Studies.

Keywords: *Project evaluation, *Marketing, *Transportation, Motor vehicle operators, Specialized training, Transportation brokerage, School buses.

This report presents synopses of project evaluations for 44 public transportation demonstration projects sponsored by the California Department of Transportation between 1977 and 1981. A few examples of the types of projects funded are demonstrations of the 'brokering' concept for social service agencies, providing transportation for the E&H, demonstrating organized 'hitchhiking', development of transit marketing programs, development of driver training courses, development of an introduction to transit for school children, development of a bus-ferry transfer system, and demonstrating an automatic passenger counter program.

PB83-245514/GAA PC **E07**/MF **E01**
National Building Research Inst., Pretoria (South Africa).
Guidelines for Factory Building Design. Part 1. Thermal Conditions. Part 2. Lighting. Part 3. Noise Control.
c1982, 142p ISBN-0-7988-2054-3

Keywords: *Industrial plants, *Plant layout, Guidelines, Lighting, Noise reduction, Temperature control.

In a generally warm country, good thermal conditions can be maintained by attention in design to the orientation of the building, the position, size and type of windows, the heat storing capacity of the construction, insulation and control of ventilation. The achievement of adequate illumination by making the best use of daylighting, saves energy and provides illumination of high quality. As in the case of thermal requirements, a north-facing orientation of the building is advocated for this, with transluscent roof lights. Daylighting, artificial lighting, task lighting and the selection of colors and reflectances all play their part in achieving the best environment for welfare and productivity. The prime function of factory noise control, is the conservation of hearing, but the effect of noise on the efficient operation of the factory, is of equal importance. Protection of hearing, satisfactory oral communication, and the limitation of annoyance and noise pollution, demand the attention of designer and user.

PB83-246025/GAA PC **A09**/MF **A01**
Department of Agriculture, Washington, DC.
Modern Potato and Vegetable Storages,
I. L. Volkind, N. N. Roslov, and P. A. Mukhanov. c1983, 193p TT-75-520001
Trans. of mono. Sovremennye Kartofele-i Ovoshchekhranilishcha, Moscow, 1971 by B. R. Sharma. Sponsored in part by National Science Foundation, Washington, DC.

Keywords: *Potatoes, *Vegetables, *Food storage, Books, Ventilation, Equipment, Cooling, Heating, Quality control, Construction, Investments, Design, Diagrams, Tables(Data).

This book contains a description of methods of storing potates and vegetables in cold storage based on modern scientific and practical experience. It describes the fundamentals of modern storage technology and the mechanics of the labor processes involved. A major part of the book is devoted to a modern standard storage which can be constructed on farms or in other places.

PB83-246199/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Population Policy and Family Planning Programs: Trends in Policy and Administration.
Working paper,
Kandiah Kanagaratnam, and Catherine S. Pierce. c1980, 31p WP-411

Keywords: Trends, Community relations, Health, *Family planning.

This study attempts to summarize recent trends in population policy and examines some of the main administrative problems likely to be encountered in the delivery of family planning services in the next few years. (Copyright (c) The World Bank 1818 H Street, N.W. Washington, D.C. 20433 U.S.A. 1980.)

PB83-246207/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Health Problems and Policies in the Developing Countries.
Working paper,
Fredrick Golladay, and Bernhard Liese. c1980, 62p WP-412

Keywords: *Health, *Health planning, *Financial planning, Policies, Financing, Health services, Health care.

After two decades of neglect, health has reappeared as a significant concern among development authorities and financing institutions. This paper focuses on the principal health policy issues that are expected to confront national authorities in developing countries over the next two decades. It also examines problems in the organization and operation of basic health services, and the financing of health care. (Copyright (c) 1980 The World Bank 1818 H Street, N.W. Washington, D.C. 20433 U.S.A.

PB83-246223/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Developing Countries and International Shipping.
Working paper,
Harold Hansen. c1981, 171p WP-502

Keywords: *Ships, *Transportation, *Waterway transportation, Merchant ships, Evaluation, Foreign trade, Benefits, Shipping lines.

In recent years many developing countries have considered or taken steps to develop or expand national merchant marines to serve their foreign trades. The purpose of this paper is to consider whether and under what circumstances developing countries can benefit from investments in international shipping. In recent years, much has been said and written to encourage developing countries to invest in national shipping lines to carry their foreign trade. In examining the issue, the paper finds no overwhelming evidence either favouring or arguing against such investment. (Copyright (c) The World Bank 1818 H Street, N.W. Washington, D.C. 20433 U.S.A. 1981.)

PB83-246280/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Economic Motivation Versus City Lights: Testing Hypotheses about Inter-Changwat Migration in Thailand.
Working paper,
Fred Arnold, and Susan H. Cochrane. c1980, 47p WP-416

Keywords: *Migration, *Economic development, Economic conditions, Employment, Farms, Economic factors, Developing countries, Thailand.

This paper is an expansion of the migration analysis done as part of the Basic Economic Mission to Thailand and contained in Working Paper No. 337. In the current paper the analysis is extended to include the direction as well as level of migration flows between provinces (changwats) and this analysis is integrated with that of others who have done migration research in Thailand. The major conclusion of policy relevance from this paper is that the level of migration will increase as economic development proceeds, but the direction of movement will depend on the relative economic opportunities in various changwats. It is the latter that might be most susceptible to policy manipulation.

PB83-246421/GAA PC **A04**/MF **A01**
Florida Water Resources Research Center, Gainesville.
Effect of Excess and Limited Soil Moisture on Nitrogen Fixation of Several Leguminous Crops.
Technical completion rept.,
J. M. Bennett, and S. L. Albrecht. 31 May 83, 65p
PUB-69, W83-03687, , OWRT-A-044-FLA(1)
Contracts DI-14-34-0001-1110, DI-14-34-0001-2110

Keywords: *Soils, *Leguminous plants, Beans, Droughts, Flooding, Soybeans, Plant growth, Greenhouses, Aeschynomene americana, Alfalfa, Cowpea, Desmodium heterocarpon.

Greenhouse experiments were conducted to examine the effects of flooding and drought on the leaf and nodule water status, stomatal conductance, root respiration and nitrogen fixation of cowpea (Vigna unuiculata), alfalfa (Medicago sativa), soybean (Glycine max), bean (Phaseolus vulgaris), Aeschynomene americana, and Desmodium heterocarpon. Soybeans, cowpeas, and Aeschynomene exhibited a tolerance to flooding and the capacity to fix nitrogen in flooded plants remained about the same as the well-watered controls, whereas flooded Desmodium, bean, and alfalfa showed marked reductions in nitrogenase activity with a concommitant decline in plant water status and root respiration. Drought stress resulted in reductions in leaf and nodule water potentials, stomatal conductance, and root respiration as gravimetric soil water content decreased below 1% in the sandy soil medium. In general, nitrogenase activity declined along with other physiological processes, however, there was an indication that nitrogen fixation was more severely inhibited by drought.

PB83-246454/GAA PC **A05**/MF **A01**
Iowa State Water Resources Research Inst., Ames.
Technology Transfer Program: Urban Stormwater Management Implementation in Iowa.
Completion rept.,
Ronald L. Rossmiller. Mar 83, 99p ISWRRI-132,
W83-03696, , OWRT-A-082-IA(1)
Contract DI-14-34-0001-2117
Also pub. as Iowa State Univ., mes. Engineering Research Inst. rept. no. ISU-ERI-AMES-83220.

Keywords: *Hydrology, *Reservoirs, *Urban planning, Hydraulic models, Ordinances, Construction, Watersheds, Iowa, Design flood, Urban hydrology.

The objective of the recently completed Iowa Urban Stormwater Management Program was to make stormwater management an integral part of the activities of planners, engineers and politicians in existing urban areas and in new developments around metropolitan areas. Included in this overall objective were the legal, institutional, planning and technical aspects of stormwater management. Two concurrent studies were undertaken at the University of Iowa and at Iowa State University. The studies at the University of Iowa Law College concentrated on the legal and institutional aspects of urban stormwater management. The studies at Iowa State University concentrated on the planning and technical aspects of urban stormwater management.

PB83-246538/GAA PC **A04**/MF **A01**
Arizona Univ., Tucson. Dept. of Hydrology and Water Resources.
Comparative Evaluation of Ground-Water Management Techniques.
Completion rept. 1 Oct 79-30 Sep 81,
Jacquel L. Emel, Judith M. Dworkin, Thomas
Maddock, III, and Michael Bradley. Jul 83, 58p W83-03704, , OWRT-B-081-ARIZ(1)
Contract DI-14-34-0001-0204

Keywords: *Management techniques, *Ground water, *Water supply, Aquifers, Water rights, Water conservation, Policies, Statutes, Comparison, Evaluation, Western Region(United States).

A summary and evaluation of groundwater supply management programs in the western United States is presented. Statutes, district mandates, and court decisions set out general objectives which are interpreted and implemented by administrative agencies. While the objectives are for the most part philosophically derived, the implementation mechanisms are the result of both philosophic interpretation and hydrologic science. As established in this research, the objectives of state and district groundwater supply policies are property rights protection and aquifer development management. The former relates to protection of access, and the latter to planned depletion or conservation goals.

PB83-246686/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Measuring Urban Malnutrition and Poverty: A Case Study of Bogota and Cali, Colombia.
Working paper,
Rakesh Mohan, M. Wilhelm Wagner, and Jorge
Garcia. c1981, 89p WP-447
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC 20433.

Keywords: *Diseases, *Nutrition, Income, Statistical data, Developing countries, *Colombia.

The paper attempts to measure the extent of malnutrition and poverty in the cities of Bogota and Cali, Colombia. It determines lower bound estimates of the proportion of people who simply do not have incomes adequate to cover the barest minimum of nutritional requirements. Methods usually used to estimate malnutrition are examined critically and the conceptual and empirical difficulties inherent in such estimations are outlined. An attempt is made to account for some of these difficulties by using household level data which account for differences in age-sex composition and household size. However, other difficulties remain owing to the absence of actual food expenditure data. (Copyright (c) 1981 The World Bank 1818 H Street, N.W. Washington, D.C. 20433, U.S.A.)

PB83-246710/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Economics of Supplemental Feeding of Malnourished Children: Leakages, Costs, and Benefits.
Working paper,
Odin K. Knudsen. c1981, 90p WP-451
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC 20433.

Keywords: *Children, *Nutrition, *Food supply, Project management, Evaluation, Cost estimates, Mathematical models, Mortality, Productivity, India.

This paper analyzes some of the economic issues involved in the supplemental feeding of malnourished children. The paper is divided into four major sections. The first section discusses the potential leakages to other family members and other households that are common to both on-site and take-home feeding programs. The second section describes the probability of errors involved in using entry and exit criteria in supplemental feeding programs and describes a feasible criterion for entry based on a child's weight gain. The third presents a simulation model for estimating the number of beneficiaries and costs of supplemental feeding under different prevelances of malnutrition, durations of feeding, and probabilities of recovery and relapse. The fourth calculates the costs and benefits of a supplemental feeding program by using efficiency, social and basic need approaches. (Copyright (c) 1981 The World Bank 1818 H Street, N.W. Washington, D.C. 20433 U.S.A.)

PB83-246736/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Regional Aspects of Family Planning and Fertility Behavior in Indonesia.
Working paper,
Dov Chernichovsky, and Oey Astra Meesook. c1981, 71p WP-462

Keywords: *Family planning, *Fertility, Developing countries, Population growth, Statistical analysis, *Socioeconomic status, *Indonesia.

This paper discusses the recent decline in the population growth rate of Indonesia which has been achieved at a relatively low level of income and socio-economic development. Evidence is presented of this decline which is largely attributed to the fall in the total fertility rate in Java-Bali. The much higher growth rate of population in the Outer Islands remains a matter of concern and the paper accordingly focuses on differences between Java-Bali and the Outer Islands. The paper briefly reviews the history and organization of the family planning program in Indonesia, attempts to identify those factors which have been responsible for its success and to assess its prospects for the future. It then presents the results of a multivariate analysis, using data from the 1976 Intercensal Population Survey, which attempts to explain fertility behavior and family planning practice by socio-economic factors as well as the availability of family planning services. (Copyright (c) 1981 The World Bank 1818 H Street, N.W. Washington, D.C. 20433, USA.)

PB83-246769/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Improving Irrigated Agriculture: Institutional Reform and the Small Farmer.
Working paper,
Daniel W. Bromley. c1982, 96p WP-531, ISBN-0-8213-0064-4
Library of Congress catalog card no. 82-13422.

Keywords: *Farming, *Water supply, *Irrigation, Pumping, Human behavior, Adaptation, Allocations, Assessments, Decision making, Water distribution, Farms, Project planning, Risk, Developing countries, Water requirements.

Irrigation is a technological and institutional innovation which permits cultivation of lands otherwise ill-suited to agriculture. The institutional environment in which irrigation takes place is critical to the successful operation of any system. This institutional environment has received little analytical attention by those concerned with irrigation. A model of farmer interdependence is developed and is related to the concept of farmers as cautious optimizers. This allows a focus on institutional uncertainty as a major impediment to creating irrigation systems which meet both efficiency and equity goals. (Copyright (c) 1982, The World Bank.)

PB83-247049/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Rural Projects Through Urban Eyes: An Interpretation of the World Bank's New-Style Rural Development Projects.
Working paper,
Judith Tendler. c1982, 100p WP-532, ISBN-0-8213-0028-8
Library of Congress catalog card no. 82-13412.

Keywords: *Project planning, *Rural areas, Local government, Agriculture, Services, Government policies, Developing countries, Social services, Rural planning, Poverty groups.

This paper is a suggested political economy of the Bank's new-style rural development projects. It attempts to describe some of the things that happen in the political environment of a project when governments, assisted by the Bank, redirect their public-sector services and subsidies to the rural poor. The nature of implementing agencies as political actors is also explored, including how their particular tasks contribute to the formation of their political character--infrastructure vs. agricultural extension vs. social services like health and education. The purpose of this exploration is to broaden our understanding of how the new rural projects have fared--to help explain successes as well as problems. The paper also suggests how the features of the political environment might be taken into account in the selection and design of future rural projects. (Copyright (c) 1982 The International Bank for Reconstruction and Development/The World Bank 1818 H Street, N.W. Washington, D.C. 20433, U.S.A.)

PB83-247080/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Industrialization and Growth: The Experience of Large Countries.
Working paper,
Hollis B. Chenery. c1982, 38p WP-539, ISBN-0-8213-0097-0
Library of Congress catalog card no. 82-15961

Keywords: *Industrial development, Economic conditions, Policies, *China, Industrial growth.

This paper discusses common elements of the experience of large developing countries with industrialization, drawing on the World Bank's research project on

'The Sources of Industrial Growth and Structural Change.' The paper, which was presented to a conference of the Chinese Academy of Science, is designed to provide a comparative framework for assessing the performance of the Chinese economy. It shows that, despite its unique features, China shares many characteristics with other large semi-industrial countries. Some implications for trade policy and future growth are noted. (Copyright (c) 1982 The International Bank for Reconstruction and Development/The World Bank 1818 H Street, N.W. Washington, D.C. 20433, U.S.A.)

PB83-247098/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Implementing Programs of Human Development.
Working paper,
Nat J. Colletta, Jacob Meerman, Milton Esman, Joseph Mbindyo, and John Montgomery. c1981, 378p WP-403

Keywords: *Social change, *Health, Family relations, Personnel development, Culture(Social sciences), *Socioeconomic status, Families.

Political support, finance, administration and demand (the way families and individuals respond to services) are crucial linked factors in improving education, health, hygiene and nutrition, especially in the poorest areas of the developing nations. Recognizing these links, the World Bank staff arranged a series of seminars and workshops in the fall of 1979, bringing together the authors of these papers, other consultants and invited experts, and a wide range of Bank staff to discuss the issues treated in these studies. The resulting interchange is reflected in the five studies in this volume. They are written from different disciplinary perspectives--political science, public finance, and public administration respectively for the first three, and a combination of sociology and social anthropology for the papers on sociocultural influences and the role of the family. (Copyright (c) 1980 The World Bank.)

PB83-247122/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Managing Information for Rural Development: Lessons from Eastern Africa.
Working paper,
Guido Deboeck, and Bill Kinsey. c1980, 80p WP-379

Keywords: *Information systems, *Rural areas, *Information services, Meetings, *Africa, User needs, Specialized training, Data acquisition.

This study summarizes the discussions and principal conclusions of the Regional Workshop on Monitoring and Evaluation of Rural Development Projects in Eastern Africa held in Nairobi in April 1979. The basic purpose of the Workshop was to provide a forum for extracting lessons from field experiences with managing information for rural development. The methodologies for monitoring and evaluating the technical, economic, and social impacts of rural development projects have undergone considerable development and modification in Eastern Africa. The lessons which may be learned from the wealth of practical experience in the region relate to a large number of issues currently being raised in projects elsewhere: identification of priority users of information; the type and frequency of data collection efforts; problems of translating raw data into useful information; location and staffing of monitoring and evaluation units; the resource requirements of implementing project information systems; training needs; and the effective management of rapidly growing volumes of information on rural development projects. (Copyright (c) The World Bank 1980.)

PB83-247338/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Macroeconomic Implications of Factor Substitution in Industrial Processes.
Working paper,
Howard Pack. c1980, 76p WP-377

Keywords: *Industrial development, *Technology assessment, Labor estimates, Substitution, Manufacturing, Economic impact.

This paper examines the scope for capital-labor substitution in the LDCs, that is, it is concerned with efficient alternatives to best-practice techniques used in the developed countries. It addresses three principal questions: How do the benefits to private producers of systematically adopting appropriate technology compare with those of adopting capital-intensive technology; How surmountable are the obstacles to adopting appropriate technology that is available; and If the benefits of adopting appropriate technology are great and the obstacles surmountable, why are LDC producers opting for capital-intensive processes. The analysis relies on engineering-economic analyses to answer the first question; a reformulation of obstacles in a cost-benefit framework to answer the second; and a discussion of alternative profit-seeking activities of producers to answer the third. (Copyright (c) 1980 by The World Bank.)

PB83-247494/GAA PC **A99**/MF **A01**
New York State Coll. of Agriculture and Life Sciences, Ithaca. Dept. of Agricultural Engineering.
Wastewater Treatment with Plants in Nutrient Films.
Final rept. Oct 79-Jun 82,
W. J. Jewell, J. J. Madras, W. W. Clarkson, H. DeLancey-Pompe, and R. M. Kabrick. Aug 83, 626p EPA-600/2-83-067
Grant EPA-R-807134
Sponsored in part by Office of Water Research and Technology, Washington, DC.

Keywords: *Aquaculture, *Plants(Botany), *Sewage treatment, Nutrients, Microorganisms, Plant growth, Feasibility, Water pollution control, Area, Biochemical oxygen demand, Grasses, Nitrogen cycle, Potable water, Plant physiology, Plant growth, Comparison, Tolerances(Physiology), Greenhouses, Ornamental plants, Graphs(Charts), Secondary sewage treatment.

The nutrient film technique (NFT) is a unique modification of a hydroponic plant growth system which utilizes plants growing on an impermeable surface. A thin film of water flowing through the extensive root system provides nutrients for plants and associated microbial growth. Root masses up to 15 cm thick or more have been obtained. This self-generating plant system could be used as a filter to immobilize and use the gross and trace organics in wastewater. The goal of this study was to determine the economic, technical, and practical feasibility of using plants grown in the NFT system as pollution control systems. NFT systems appear capable of providing secondary quality treatment with some nutrient removal on a relatively small area compared to overland flow systems. At loading rates of 10 cm per day the effluent quality with primary settled sewage was often less than 10 mg/l for suspended solids and biochemical oxygen demand. Estimated area needs of an NFT system designed for BOD and SS removal appear to be approximately 3 hectares for a community of 10,000 people.

PB83-247833/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Energy Options and Policy Issues in Developing Countries.
Working paper,
D. G. Fallen-Bailey, and T. A. Byer. c1979, 118p WP-350
Color illustrations reproduced in black and white.

Keywords: *Electric power, *Energy management, *Energy source development, Electric power generation, Planning, Government policies, Energy demand, Energy conservation.

This paper reviews the energy resources of developing countries, with particular emphasis on those which import oil. It discusses the nature of these resources, the cost of developing them and the policy issues raised in doing so. The need for and implementation of national energy planning, energy demand management, conservation and pricing policy are described. Energy development strategies for countries in energy surplus, energy balance and energy deficit are discussed, as are problems related to petroleum refining and energy use in the transport sector. Issues related to power generation and fuel substitution and the relevant costs are reviewed. (Copyright (c) 1979 by The World Bank.)

PB83-247841/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Growth and Equity in Semi-Industrialized Countries.
Working paper,
Joel Bergsman. c1979, 124p WP-351

Keywords: *Economic development, *Industrial development, Government policies, Poverty, Income maintenance, Economic policy.

Semi-industrialized countries are middle-income less-developed countries with important manufacturing sectors, such as Brazil, Korea, Mexico, the Philippines, Turkey, and Yugoslavia. Their experience over the last few decades is analyzed as to economic growth, income distribution and the extent of poverty. Different results are related to differences in policies (especially as regards foreign trade and agriculture, as well as manufacturing) and to initial differences in social and economic conditions. Conclusions as to policies to promote economic growth and to alleviate poverty are discussed. (Copyright (c) 1979 by The World Bank.)

PB83-247858/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Economic and Social Analysis of Projects and of Price Policy: The Morocco Fourth Agricultural Credit Project.
Working paper,
Kevin M. Cleaver. c1980, 68p WP-369

Keywords: *Agriculture, *Project planning, Benefit cost analysis, Prices, Policy, Irrigation, Agricultural equipment, Economic analysis, Investments, Developing countries, Morocco.

The purpose of this paper is to (a) apply the economic and social cost benefit methodology of Little-Mirrless and Squire-van der Tak to the Fourth Agricultural Credit Project in Morocco, and (b) discuss the operational implications of the results including price policy. The paper concludes that investments in mechanization, irrigation equipment, wells, draft animals and small implements generate a higher rate of return to Morocco's economy than to farmers due to price distortions biased against agriculture. (Copyright (c) 1980 The World Bank 1818 H Street, N.W. Washington, D.C. 20433 U.S.A.)

PB83-248005/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Rural Poverty Unperceived: Problems and Remedies.
Working paper,
Robert Chambers. c1980, 57p WP-400

Keywords: *Socioeconomic status, *Rural areas, Regional planning, Requirements.

The thesis of this paper is that there are major obstacles to perceiving the nature and the extent of rural poverty in developing countries. These obstacles originate not only in the nature of rural poverty itself, but also in the condition of those, not themselves of the rural poor, who do or, more significantly, do not perceive that poverty. The argument has implications for all rural development programs and projects, and for the training of staff. The conclusion is that reversals of current positions and practices are required if the obstacles are to be surmounted, if the nature and the extent of rural poverty are to be truly appreciated, and if future actions are to be tailored to the actual needs of the rural poor. (Copyright (c) 1980 The World Bank.)

PB83-248013/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Human Factors in Project Work.
Working paper,
Heli Perrett, and Francis J. Lethem. c1980, 92p WP-397

Keywords: *Project evaluation, *Labor relations, *Employee participation, Populations, Social effect, Social factors, Benefits.

This paper, based on several years of operational experience by Bank staff, proposes a framework to make the consideration of social and behavioral factors a useful and efficient part of project work, particularly during the project development stages. It has special relevance for poverty-oriented projects but is not limited to them. (Copyright (c) 1980 The World Bank 1818 H Street, N.W. Washington, D.C. 20433, U.S.A.)

PB83-248021/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Publishing for Schools Textbooks and the Less Developed Countries.
Working paper,
Peter H. Neumann. c1980, 89p WP-398

Keywords: Books, *Economic analysis, *Education.

Elements of publishing for schools are described in some detail, such as types, historical development, and economics of publishing; concepts and terms; author/publisher relationships; organizational development and institution building. Special emphasis (including case studies) is given the problems faced by developing countries and ways by which to assist them. Suggestions for a blueprint and for the execution of a project are included. (Copyright (c) 1980 The World Bank.)

PB83-248047/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Economic Aspects and Policy Issues in Groundwater Development.
Working paper,
Ian Carruthers, and Roy Stoner. c1981, 123p WP-496

Keywords: *Water wells, *Ground water, *Irrigation, Developing countries, Water wells, Aquifers, Water distribution, Drainage, Cost analysis, Ground water recharge, Social effect, Drawdown, Competition, Electricity, Standards, Water quality, Groundwater mining.

Technical, economic and social aspects of groundwater development policy are discussed. The various groundwater system components and categories of agricultural demands are analyzed. Opportunities exist for obtaining benefits from conjunctive use with surface water. These are stressed as well as the economic aspects of wells and well-field design and the need to consider drainage before soil problems become insurmountable. Groundwater development is usually very profitable, and it is therefore likely to be monopolised by a few farmers or overexploited by the majority. Public control to obtain an equitable regime is desirable, but institutional barriers are enormous. The pros and cons of public and private sector development are discussed. Once they are developed, aquifers need overall management to maximize economic yield and to safeguard water quality. Operating experiences from several countries are quoted, and the role of mathematical models to gain improved insight is briefly considered. (Copyright (c) 1981, The World Bank.)

PB83-248112/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Process of Industrial Development and Alternative Development Strategies.
Working paper,
Bela Balassa. c1980, 48p WP-438
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Economic development, Industries, Developing countries, Strategies, Planning, *Industrial development, Economic policy.

The essay summarizes the author's ideas on the process of industrial development and on industrial development strategies. Drawing on his research over the last decade (see Appendix) the author examines the determinants of early industrial development, evaluates the first stage of import substitution, analyses the principal characteristics and results of inward-oriented and outward-oriented industrial development strategies and discusses the responses of the newly-industrializing developing countries to the external shocks suffered after 1973. Finally, the essay provides policy prescriptions for the future, with consideration given to the prospects for world trade in manufactured goods. (Copyright (c) 1980 by The World Bank.)

PB83-248153/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Higher Education in Developing Countries: A Cost-Benefit Analysis.
Working paper,
George Psacharopoulos. c1980, 136p WP-440
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Education, *Cost benefits, Universities, Benefit cost analysis, Socioeconomic status.

The purpose of this paper is to take a close look at the socio-economic rationale of higher education provision in developing countries. This is done by reviewing the costs and benefits associated with investment in higher education as a whole and especially in different post-secondary subjects. University costs, and in particular benefits, are treated here in their broadest sense to arrive at the true contribution of higher education to the standard of living of the present and future generations. This socio-economic evaluation of the higher education subsector is performed by reference to a multi-country, multi-period data set, which has been augmented by nonquantitative considerations. (Copyright (c) 1980 The World Bank.)

PB83-248211/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Comparative Study of the Management and Organization of Irrigation Projects.
Working paper,
Anthony F. Bottrall. c1981, 282p WP-458
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Irrigation, *Management planning, *Southeast Asia, Water distribution, Management, Improvement, Performance evaluation, Recommendations, Project planning, Small farms.

This paper is primarily concerned with development of an analytical framework for the monitoring and evaluation of irrigation project management in developing countries. It is based on an extensive review of the English language literature on the subject, and four field studies in South and East Asia. The central part of the report consists of a series of detailed arguments to explain and justify the particular evaluation framework prepared. A principal focus is the performance of the activity of water distribution since it is peculiar to irrigated agriculture. Special attention is given to identifying and recommending those organizational structures and management procedures which appear most likely to serve the interests of the rural poor, particularly small farmers and those at the tail-end of irrigation systems. The study concludes that there are immense opportunities for improvements in the performance of irrigation projects through management reform and better water distribution. (Copyright (c) 1981, The World Bank.)

PB83-248229/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Adoption of Agricultural Innovation in Developing Countries: A Survey.
Working paper,
Gershon Feder, Richard E. Just, and David Zilberman. c1982, 81p WP-542, ISBN-0-8213-0103-9
Library of Congress catalog card no. 82-15930.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Agriculture, *Agricultural economics, Manpower, Credit.

The paper reviews various studies which have provided a description of and possible explanation to patterns of innovation adoption in the agricultural sector. It therefore covers both empirical and theoretical studies. The discussion highlights the diversity in observed patterns among various farmers' classes as well as differences in results from different studies in different socioeconomic environments, and reviews the attempts to rationalize such findings. Special attention is given to the methodologies which are commonly used in studies of innovation adoption, and suggestions for improvements of such work through the use of appropriate economometric methods are provided. (Copyright (c) 1982 by The World Bank.)

PB83-248237/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Policy Interventions for Technological Innovation in Developing Countries.
Working paper,
Charles Cooper. c1982, 64p WP-441
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Technology transfer, *Technology assessment, *Industrial development, Technology innovation, Employment, Income, Industries.

This paper assesses the potential social payoff of alternative measures that might be taken to promote innovation in developing countries. It is mainly concerned with the general issues of encouraging technical innovation in the nonagricultural sectors. Part 1 discusses the process of innovation and describes the skills associated with it. Part 2 sets forth some of the special problems that developing economies encounter in building up innovative skills. Part 3 draws together some of the main implications for policy and explains how priorities for the development of local innovative activities might be determined. Part 4 analyzes the patterns of innovative activity that might be needed in developing economies--distinguishing between the modern formal sector and the informal sector, and between large and small enterprises in the formal sector. Part 5 summarizes the main conclusions and suggests some of the implications of adopting an approach that stems from these conclusions. (Copyright (c) 1980 The World Bank.)

PB83-248245/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
International Technology Transfer: Issues and Policy Options.
Working paper,
Frances Stewart. c1979, 135p WP-344
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Technology transfer, Cost analysis, Policies, *Marketing.

This paper surveys the issues raised by technology transfer to developing countries. Technology is a vital part of the development process, a necessary input into all activity. Because of the historical domination of research and development by developed countries, a very large part of the technology used is transferred from developed countries. The transfer raises four major issues: those of the costs of the transfer, the appropriateness of products and techniques which are transferred, the effects of the transfer on learning and technological development in LDCs, and the effects on independence. The paper considers the consequence of the transfer and the range of policies that might be adopted, nationally and internationally, in relation to each of these issues. (Copyright (c) 1979 The World Bank.)

PB83-248278/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Educational Use of Mass Media.
Working paper,
Gloria Feliciano, Alan Hancock, Gerald Hein, Albert Horley, and Janet Jenkins. c1981, 134p WP-491
Microfiche copies only. Paper copies available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Education, Radio broadcasting, Television broadcasting, Languages, Curricula.

This volume is composed of an introduction and seven chapters , all of which are relevant to the educational use of mass media in Less Developed Countries (LDCs). Each chapter deals with one of the salient issues that LDCs educators and decision-makers inevitably encounter when they think about using mass media to further the country's education and development. (Copyright (c) 1981 The World Bank.)

PB83-248518/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Family Planning Programs: An Evaluation of Experience.
Working paper,
Roberto Cuca. c1979, 155p WP-345

Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: Evaluation, Government policies, Projects, Fertility, Developing countries, Foreign countries, *Family planning.

The purpose of this paper is to review the evolution of family planning policy and program activity in those countries in which there is now an official family planning policy as well as some program activity, and to discuss the role of family planning programs in promoting declining fertility rates. (Copyright (c) 1979 The World Bank 1818 H Street, N.W. Washington, D.C. 20433, U.S.A.)

PB83-248534/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Food Distribution and Nutrition Intervention: The Case of Chile.
Working paper,
Lloyd Harbert, and Pasquale L. Scandizzo. c1982, 57p WP-512, ISBN-0-8213-0001-6
Library of Congress catalog card no. 82-8370.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Food supply, *Food services, *Nutrition, Distribution systems, Statistical data, Nutritional deficiency diseases, Chile.

The paper analyzes the impact of Chile's Complementary Feeding Program (CFP), both on the direct and indirect beneficiaries. The paper describes Chile's major nutrition intervention programs and establishes the relative importance of the CFP in terms of budgetary expenditures and number of beneficiaries reached. It briefly reviews the program's past limitations, recent reforms and potential effectiveness. Finally, using data from the 1974-75 National Nutrition Survey, it examines whether participation by beneficiaries in the program was responsible for any significant differences in various indicators of nutritional wellbeing, once factors such as income, urban/rural location, sex and age are taken into account. (Copyright (c) The World Bank 1982.)

PB83-248559/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Integrating Family Planning with Health Services: Does It Help.
Working paper,
Rashid Faruqee. c1982, 56p WP-515, ISBN-0-8213-0003-2
Library of Congress catalog card no. 82-8405.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: Effectiveness, Project management, Statistical data, India, *Family planning, Punjab(India).

The findings of the study show that integration was more effective in recruiting family planning acceptors than was the provision of family planning alone. They also show that integration was more cost effective than separate services and more equitable in distributing family planning services to all socioeconomic groups. Integration also produced better contraceptive protection. The findings show that health benefits were also impressive--in effectiveness, in efficiency, and in equity.

PB83-248583/GAA PC **E11**/MF **E01**
Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek, Delft (Netherlands).
Trade, Transport and Technology: The Functioning of World Seaport Complexes in the Eighties (15th International TNO Conference),
P. M. Baven. 1982, 243p

Keywords: *Coasts, *Research and development, *Industrial development, *Marine engineering, *Netherlands, *International trade, Developing countries, Industries, Cargo transportation, Energy, Global.

The theme of the present Conference does not coincide with one of the main items on our program, but the list of current research which is or may be of interest for the further development of world seaport areas and, in addition, of subjects in the field of marine technology, is surprisingly long. We have an opportunity to investigate and discuss a number of questions, the answers to which may be decisive for the course of events in the next decades: the relations between industry, seaports and the transport system; changes in the energy field; new technologies; the chemical and oil industries; the risks involved in the large-scale transportation of e.g. LPG.

PB83-249029/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Population and Poverty in the Developing World.
Working paper,
Nancy Birdsall. c1980, 102p WP-404
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Fertility, *Economic development, Population growth, Public health.

This paper analyzes the association between poverty and rapid population growth. (Copyright (c) The World Bank 1980.)

PB83-249037/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Effects of Education on Health.
Working paper,
Susan H. Cochrane, Donald J. O'Hara, and Joanne Leslie. c1980, 102p WP-405
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Health education, *Education, *Health, Developing countries, Mortality, Socioeconomic status, Family relations, Nutrition.

This paper investigates, from three overlapping perspectives, the effects of education on health. The determinants of mortality are receiving increasing scrutiny because the rate of mortality reduction in the developing world appears to have slowed at levels of life expectancy below those thought attainable only a few years ago. The first perspective employed in this paper is a broad assessment of the socioeconomic determinants of mortality on a cross-national basis; using aggregate data, this paper contains a review and a reanalysis of the large body of literature that has accumulated on international differences in mortality and life expectancy. The second perspective sharpens the focus by concentrating on the relationship between education and mortality since the cross-national evidence suggests that education, or its proxy literacy, is the most important variable involved. A theoretical model of the relationship between parental education and child health is developed and used to describe how aggregate and individual data may give different estimates of the relationship. The third perspective employed reviews and reanalyzes the evidence at the subnational level. Individual evidence is reviewed on the relationship between parental education and both child nutrition and child mortality. This evidence is then compared with aggregate data to test the implications of the model. (Copyright (c) The World Bank 1980.)

PB83-249078/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Trade among Developing Countries: Theory, Policy Issues, and Principal Trends.
Working paper,
Oli Havrylyshyn, and Martin Wolf. c1981, 123p WP-479
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *International trade, Trends.

The paper presents the early results of empirical work on trade among developing countries. The results, which are preliminary and will be further expanded, are based on data derived from a sample of thirty-three developing countries that account for about 60 percent of developing countries' exports to one another. The main conclusion is that non-fuel trade among developing countries, excluding capital-surplus oil exporters, accounted for a remarkably stable share of their total trade between 1963 and 1977. (Copyright (c) 1981 by The World Bank.)

PB83-249086/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Adjustment Experience and Growth Prospects of the Semi-Industrial Economies.
Working paper,
Frederick Z. Jaspersen. c1981, 141p WP-477
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Industrial development, *Economic development, Economic forecasting, Demand(Economics), Industrial structure.

During the decade of the 1970s, the world economy was beset by a series of disturbances which adversely affected the non-oil developing countries; rising prices for their oil imports, slower OECD growth and reduced demand for their exports resulted in a deterioration in the external position of many of these countries. The more advanced developing countries (those known as semi-industrial countries, or SICs) out-performed all other non-oil countries in adjusting to the deterioration in the external environment which they faced. Through a combination of demand management, structural adjustment, and increased external borrowing from commercial sources, a number of these countries were able to expand investment, output, and employment while simultaneously strengthening their external position. This paper presents an analytical framework for quantifying the relative importance of demand management (absorption) and structural adjustment (expenditure and output switching between tradeable and non-tradeable goods, and accelerated growth of output) in the adjustment process. (Copyright (c) 1981 by The World Bank.)

PB83-249094/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Notes on the Analysis of Capital Flows to Developing Nations and the 'Recycling' Problem.
Working paper,
Ralph C. Bryant. c1981, 74p WP-476
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Financial management, Balance of payments, Investments, Prices.

This paper summarizes and then criticizes the conventional analysis of the interrelations between financial markets in the industrialized countries (the North) and capital flows to the developing nations (the South). The proximate purpose of the paper is to clarify concepts and analytical perspectives. Its ultimate purpose is to suggest how a study of capital flows to the South should be integrated into an overall macroeconomic analysis of the effects of the economic environment in the North and in the oil-producing countries on the South's prospects for development. (Copyright (c) 1981 by The World Bank.)

PB83-249110/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Food Policy Issues in Low-Income Countries.
Working paper,
Edward Clay, Robert Chambers, Hans Singer, and Michael Lipton. c1981, 127p WP-473
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Food supply, *Agricultural economics, Government policies, Nutritional deficiency diseases, Production, Zambia, Bangladesh, India, Poverty.

The paper considers food policy issues in Zambia, Bangladesh, and India from the viewpoints of short-term adjustment to the energy crisis and the longer-term effects of food policy on poverty, malnutrition, and food security. Parts 2-4 present the country case studies; Part 1 is an overview drawing upon the case studies. As a general conclusion, the paper suggests that external pressures during the 1970s intensified problems of agricultural production and food supply, but that in none of the countries studied were such external pressures the cause for a serious food supply problem. (Copyright (c) 1981 The World Bank.)

PB83-249136/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Incorporating Uncertainty into Planning of Industrialization Strategies for Developing Countries.
Working paper,
Alexander H. Sarris, and Irma Adelman. c1981, 62p WP-503
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Economic development, Economic models, Investments, *International trade, *Industrial development.

This paper provides a survey of the existing literature on planning under uncertainty, focusing on issues of international trade and investment allocation. It discusses various ways of incorporating uncertainty in target-planning models and outlines proposals for possible empirical applications. In these proposed applications, the emphasis is on formulating adjustment rules that can be used to ensure that the economy stays as close as possible to a planned target path given random shocks to exogenous variables, but assuming that the underlying structure of the economy is known with certainty. (Copyright (c) The World Bank 1981.)

PB83-249185/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Effects of Population Growth, of the Pattern of Demand, and of Technology on the Process of Urbanization: An Application to India.
Working paper,
Rakesh Mohan. c1982, 58p WP-520, ISBN-0-8213-0008-3
Library of Congress catalog card no. 82-8600.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Demography, *Urbanization, *India, Population growth, Technology, Mathematical models, Developing countries, Rural areas, urban areas.

This paper uses a computable economy wide dynamic general equilibrium model to study the effect of population growth, the pattern of demand and of technological change on urbanization in the context of a low income developing county starting at a low level of urbanization. The model is non-linear and models two regions (rural and urban) with wages and prices adjusting endogenously. It represents a closed economy and is therefore more suited to a large country such as India. The model is validated using Indian data and the simulation traces the development of the Indian economy well from 1950 to the present. (Copyright (c) 1982 The World Bank.)

PB83-249193/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Small Industry in Developing Countries: Some Issues.
Working paper,
Dennis Anderson. c1982, 84p WP-518, ISBN-0-8213-0006-7
Library of Congress catalog card no. 82-11130.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Industrial development, Investments, Businesses, *Small businesses, Entrepreneurship, Industrial development.

This paper first examines the changing size distribution of industry in developing countries by region and over time, and, by reference to firm-level surveys, it discusses the underlying causes. The importance of markets generated by the growth of agriculture and rural incomes for the regional development of industry, both small and large scale, is noted. Second, it discusses the entrepreneurship issue, arguing that while small and large firms alike are highly responsive to the growth of markets, the measured entrepreneurial response is neither as full nor as efficient as is desirable. The third and last part discusses small industry programs and their relation to development policy. (Copyright (c) 1982 The International Bank for Reconstruction and Development/The World Bank 1818 H Street, N.W. Washington, D.C. 20433, U.S.A.)

PB83-249201/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Sociocultural Aspects of Developing Small-Scale Fisheries: Delivering Services to the Poor.
Working paper,
Richard B. Pollnac. c1981, 73p WP-490
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Fisheries, *Cooperatives, *Food supply, Cooperation, Developing countries, Project planning.

This report, is a response to the following, well established facts: (1) many developing countries mandate the use of fishermen's cooperatives in small-scale fishery development; (2) some development agencies advocate the use of fishermen's cooperatives; (3) there have been numerous failures, as well as successes, of fishermen's cooperatives. These facts, which are elaborated in the body of the paper, suggest that there is a need for an objective examination of the cooperative in the context of small-scale fisheries development programs. (Copyright (c) The World Bank 1981.)

PB83-249219/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Financing Small-Scale Industry and Agriculture in Developing Countries: The Merits and Limitations of 'Commerical' Policies.
Working paper,
Dennis Anderson, and Farida Khambata. c1982, 48p WP-519, ISBN-0-8213-0007-5
Library of Congress catalog card no. 82-8659.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Agricultural economics, *Financial management, *Agriculture, Credit, Risk, Banking business, *Small businesses, Loans, Interest rate.

The paper discusses how two factors lead to an unwillingness of financial institutions to finance small-scale industry and agriculture in developing countries: (a) controls on interest rates, and (b) the initially high risks and administrative costs involved. Most economists appeal for a relaxation of the controls. But by reference to the observed reactions of the institutions to (b), it is shown that this policy alone would not achieve an efficient flow of finance to small-scale activities. The paper discusses the role of risk-guarantee schemes in encouraging institutions to acquire the information base and the experience to reduce the risks and administrative costs over time. (Copyright (c) by The World Bank 1982.)

PB83-249227/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Private Capital Flows to Developing Countries and their Determination: Historical Perspectives, Recent Experience, and Future Prospects.
Working paper,
Alexander Fleming. c1981, 46p WP-484
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Banking, *Economic analysis, *Financial management, Financing, Credit, Banking business, Economic forecasting.

From an analysis of borrowing experience by oil-importing developing countries (OIDC's), it is concluded that in recent literature on private capital flows too much emphasis has been placed on the constraints on banking intermediaries. The key determinant of flows through banking markets is the macroeconomic environment (the orientation of global current account balances, the state of domestic loan demands in the industrialized countries, etc.) that influences the supply of funds to the banks. (Copyright (c) 1981 by The World Bank.)

PB83-249235/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Nature of Credit Markets in Developing Countries: A Framework for Policy Analysis.
Working paper,
Arvind Virmani. c1982, 205p WP-524, ISBN-0-8213-0019-9
Library of Congress catalog card no. 82-8463.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Banking, *Financial management, Payment, Liabilities, Monopolies.

The central purpose of the paper is to analyze various forms of government intervention in the loan market in terms of their effect on efficiency. This provides the essential basis for evaluating and judging these policies. It also shows where earlier policy prescriptions are correct, incomplete or wrong. (Copyright (c) 1982 by The World Bank.)

PB83-249276/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Structural Change in Trade in Manufactured Goods Between Industrial and Developing Countries.
Working paper,
Bela Ballassa. c1980, 52p WP-396
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *International trade, Exports, Imports, Commodities.

This paper examines the pattern of structural change in trade in manufactured goods between the industrial and the developing countries. It reviews recent changes in this trade and analyses its commodity composition in the light of the comparative advantage of the two groups of countries. The paper further provides projections on the growth of manufactured trade between the industrial and the developing countries in the period 1978-90. (Copyright (c) 1980 by The World Bank.)

PB83-249292/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Methodologies for Measuring Agricultural Price Intervention Effects.
Working paper,
Pasquale L. Scandizzo, and Colin Bruce. c1980, 111p WP-394
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Economic analysis, *Agriculture, Developing countries, Food consumption, Economic impact, Subsidies, Taxes, Argentina, Egypt, Kenya, Pakistan, Thailand, Yugoslavia.

This paper describes the use of micro-economic, informal methodologies in six country case studies (Argentina, Egypt, Kenya, Pakistan, Thailand and Yugoslavia) and in subsequent additional analysis. The research has confirmed that there is extensive intervention with market forces by governments in LDCs, which has turned the domestic terms of trade against agriculture and has significantly efficiency and income distribution effects. The methodologies -- which include the use of nominal and effective protection coefficients, domestic resource cost, and net economic benefit coefficients, producer and consumer subsidy equivalents and producer and consumer surpluses -- are evaluated in terms of their capacity: (a) to provide Bank staff with operationally useful instruments of analysis; (b) to offer appropriate advice to client country governments and their planning institutions concerned with pricing policies; and (c) to help bridge the methodological gap between project cost benefit analysis on the one hand and sector and country economic work on the other hand. (Copyright (c) The World Bank 1980.)

PB83-249318/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Food Security in Food Deficit Countries.
Working paper,
Shlomo Reutlinger, and Keith Knapp. c1980, 46p WP-393
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Productivity, *Food supply, Food consumption, *Grains(Food), Production, Stockpiles, Statistical analysis, Stability, Evaluation, Trade.

The central proposition of this paper is that periodic shortfalls in aggregate food consumption in the developing countries are primarily related to poor harvests in the countries and not short world supplies. Instability of food grain consumption in the 1960s and early 1970s was high in many countries while the world market was nearly stable. Comsumption was highly correlated with production. Neither stocks nor imports were apparently used aggressively enough to counter fluctuations in production. A simulation model is used to evaluate the stability of food consumption under alternative trade and stock policies. A stabilizing trade policy is shown to be by far the most effective and economically preferred instrument for achieving food security. Copyright (c) The World Bank 1818 H. Street, N.W. Washington, D.C. 20433 U.S.A. 1980.

PB83-249367/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Benefits and Costs of Food Distribution Policies: The India Case.
Working paper,
Pasquale L. Scandizzo, and Gurushri Swamy. c1982, 56p WP-509, ISBN-0-8213-0011-3
Library of Congress catalog card no. 82-8543.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Cost benefits, *Food services, *Food supply, Government policies, Distribution systems, Benefit cost analysis, Budgeting, Procurement, Populations, Nutrition, *India.

This paper analyzes some of the characteristics and the main consequences of the food distribution policies followed by the Indian Government and provides a quantification and a cost benefit analysis of their effects on: (i) consumers, (ii) producers, and (iii) the government budget. (Copyright (c) 1982 The World Bank.)

PB83-249573/GAA PC **A03**/MF **A01**
American Planning Association, Chicago, IL. Planning Advisory Service.
Water Convservation in Residential Development: Land-Use Techniques,
Welford Sanders, and Charles Thurow. 1982, 40p 373, W83-03716, , OWRT-C-0425-T(1)

Keywords: *Water management, *Urban planning, Residential buildings, Land use zoning, Selection, Land development, Economic factors, Landscaping, Building codes, Education, Water consumption.

This report, written for land-use planners in local government, describes how local governments around the country are reducing residential water demands. In particular, it examines water conservation provisions in comprehensive city plans on zoning and subdivision regulations designed to conserve water. It discusses how such land development considerations as housing types, lot layout, landscaping requirements, and density provisions can be used to reduce water consumption in new residential development. The report also provides an overview of the more general and more widely used techniques for residential water conservation: economic incentives, building code provisions, and public education programs.

PB83-249805/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Structural Adjustment Policies in Developing Economies.
Working paper,
Bela Balassa. c1981, 44p WP-464
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Economic development, Government policies, Investments, Economic factors, Loans.

The paper examines in detail the elements of a policy package that may be applied in response to external or internal shocks in the case prevalent in developing economies, when optimal policies are not applied. Thus, the recommendations simultaneously aim at responding to shocks and undertaking incentives (the exchange rate, import protection, export subsidies, and price control), incentives to save and to invest, the choice of public investments, sectoral policies in energy and agriculture, budgetary policies, and monetary policies. In the conclusions, the interdependence of the various policy measures is indicated, with further attention given to foreign borrowing. Finally, comments are offered on the international environment in which these policies operate. (Copyright (c) The World Bank 1981.)

PB83-249813/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Small-Scale Enterprises in Korea and Taiwan.
Working paper,
Sam P. S. Ho. c1980, 162p WP-384
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *South Korea, *Taiwan, *Economic development, Marketing, Labor estimates, *Small businesses, Industrial development, Industrial structure.

This study reviews the existing evidence from censuses and surveys on small enterprises in Korea and Taiwan. Its purpose is descriptive in that it seeks to provide clarifications on the changing size structure of industrial and some tertiary activities as the economies developed; on the efficiency, labor intensities, product markets and other characteristics of small enterprises; and on how small scale production is influenced by growth and by changes in development policies. A summary of findings is provided in Chapter VII. (Copyright (c) 1980 by The World Bank.)

PB83-249821/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Empirical Justification for Infant Industry Protection.
Working paper,
Larry E. Westphal. c1981, 44p WP-445
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *International trade, Protection, Exports, Imports, *Economic development, Industries, *Industrial development.

This paper argues that the empirical evidence does not disprove the efficacy of high levels of selective infant industry protection. The argument is based on two types of evidence. Recent research on technological change in developing countries provides considerable information about the nature of the costs and benefits of infant industry development, together with a tentative indication of the magnitude of the costs. In turn, recently completed cross-country comparative research provides some tentative lessons about the promotion of infant industries by means of trade policies. (Copyright (c) The World Bank 1981.)

PB83-249847/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Cost-Benefit Evaluation of LDC Industrial Sectors Which Have Foreign Ownership.
Working paper,
Garry G. Pursell. c1981, 51p WP-465
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Industrial development, *Cost benefits, *Economic analysis, Benefit cost analysis, Evaluation, Investments, Manufacturing, Economic analysis, Economic indicators.

This paper describes methods for treating foreign capital in estimating single-period cost-benefit or comparative advantage indicators such as the DRC (Domestic Resource Cost Ratio) and the ERC (Economic Return on Capital). It is shown that the presence of the specific foreign capital can make a substantial difference to all these indicators, by comparison with activities in which there is no specific foreign capital invested. These general conclusions are then illustrated with results taken from a larger study of 84 Ivory Coast manufacturing firms.

PB83-250126/GAA PC **A07**/MF **A01**
Sheladia Associates, Inc., Riverdale, MD.
Innovative Methods of Upgrading Structurally and Geometrically Deficient through Truss Bridges.
Final rept. 1 Aug 80-31 May 82,
Gajanan M. Sabnis. Apr 83, 133p FHWA/RD-82/041
Contract DTFH61-80-C-00084

Keywords: *Bridges, Defects, Renovating, Specifications, Structural design.

This study consists of investigation of current practices in several states to upgrade truss bridges; literature search for state-of-the-art perspective; evaluation of information from the FHWA bridge inventory; and search for examples of truss bridge rehabilitation. The information is used to develop and evaluate various methods to rehabilitate through truss bridges. Methods of rehabilitation are formulated, analyzed and designed to suit the most general condition of truss bridges. Several problems exist with through truss bridges; these are presented in the report.

PB83-250860/GAA PC **A04**/MF **A01**
Bureau of Reclamation, Denver, CO. Engineering and Research Center.
Preliminary Study of Solar Ponds for Salinity Control in the Colorado River Basin.
Technical rept.,
Wilbur J. Boegli, Michael M. Dahl, and Harry E. Remmers. Dec 82, 61p REC-ERC-82-19

Keywords: *Desalination, Desalting, Solar power generation, Fresh water, Brines, Benefit cost analysis, Savings, Cost comparison, California, Utah, Reverse osmosis desalination.

In this study, the Bureau of Reclamation investigates the technical and economic benefits of using solar salt-gradient ponds in the Colorado River Basin to provide salinity control and to produce project power and freshwater. It was assumed that the saline water needed for pond construction would be transported to one of two dry lakebeds in the Basin(Danby Dry Lake in southern California or Sevier Dry Lake in western Utah) as part of a salinity control/coal transport project. The ponds would be used to generate electric power that could be integrated with the Bureau's power grid or used in combination with thermal energy from the ponds to power commercially available desalination systems to produce freshwater. Economic benefits were compiled for two methods of concentrating the necessary brine for the ponds--one representing stage construction using collected brine only and the other using salt at the site to produce the concentrated brine.

PB83-250878/GAA PC **A06**/MF **A01**
Bureau of Reclamation, Denver, CO. Engineering and Research Center.
Herbicidal Residues and Environmental Effects from the Experimental Application of Two 2,4-D Formulations to Control Eurasian Watermilfoil.
Technical rept.,
N. E. Otto, J. C. Pringle, and D. Sisneros. Jul 83, 105p REC-ERC-83-1

Keywords: *Aquatic plants, *Herbicides, *Weed control, *Water pollution, Invertebrates, Tolerance(Physiology), Fishes, Bioassay, Accumulation, Tissues(Biology), Potable water, Dispersing, Environmental impacts, Chlorine aromatic compounds, Chlorine organic compounds, Dimethyl amine, Chemical analysis, Acetic acid/dichlorophenoxy, Butoxyethanol ester.

In response to the need for an effective and environmentally acceptable herbicide to control eurasian watermilfoil, a serious aquatic weed problem, an interagency research study was initiated involving the USBR (Bureau of Reclamation) and the COE (U.S. Army Corps of Engineers). This document reports the tolerance and label amendment efforts done by the USBR. Experimental small-plot applications of 2,4-D dimethylamine (DMA) and butoxyethanol ester (BEE) at rates of 20 and 40 lb/acre (22.5 and 45 kg/ha) were made at Banks Lake, Washington and Fort Cobb Reservoir, Oklahoma with subsequent water, hydrosoil, invertebrate organism, and fish flesh sample collection and analysis for residues, through 56-days posttreatment. The temporary potable water tolerance of 0.1 mg/L (0.1 p/m) was exceeded in three 1-day posttreatment samples (of 1680 water samples analyzed) or 0.18% of the total samples.

PB83-251397/GAA PC **E13**/MF **E13**
Construction Industry Research and Information Association, London (England).

Trenching Practice,
D. J. Irvine, and R. J. H. Smith. c1983, 69p CIRIA-97,
ISBN-0-86017-192-2
Also pub. in ISSN-0305-408X.

Keywords: *Soils, *Construction, Excavation, Sheet piling, Soil properties, Supports, Accident prevention, Structural design.

This is a guide to safe practice in the design and use of temporary support for trenches not deeper than 6 metres. It is intended for the use of designers both of permanent and temporary works, temporary works co-ordinators and supervisors, estimators and planning engineers. It covers the identification of basic information about the ground and proposed works that is essential for the design of proper supports; the choice of appropriate support systems and methods of groundwater control; simple methods for the design of struts and walings; the procedures for installing and withdrawing supports, and check lists for design, planning and day-to-day supervision of the works.

PB83-252692/GAA PC **A24**/MF **A01**
National Inst. on Drug Abuse, Rockville, MD. Office of Science.
Problems of Drug Dependence, 1982. Proceedings of the Annual Scientific Meeting (44th), the Committee on Problems of Drug Dependence, Inc.
Research mono. series,
Louis S. Harris. Apr 83, 567p* NIDA/OS/83-01, NIDA/RM SER-43
Also pub. as National Inst. on Drug Abuse, Rockville, MD. Office of Science rept. no. DHHS/PUB/ADM-83-1264. Library of Congress catalog card no. 83-600528.

Keywords: *Drugs, *Health, Psychiatry, Sociology, Epidemiology, Clinical medicine, Pharmacology, Rehabilitation, Laboratory animals, Research, Psychopathology, Psychotherapy, Toxicology, Narcotics, Alcoholism, Drug receptors, Drug abuse, Drug users.

This volume presents the proceedings of the 44th Annual Scientific Meeting of the Committee on Problems of Drug Dependence, Inc., held in Toronto, Canada, June 27-30, 1982. Included are reviews of current research on all aspects of drug abuse and drug dependence (some in condensed form) and annual reports on NIDA-supported dependence liability tests of new compounds. Chemistry and pharmacology of abused drugs, clinical pharmacology, and treatment issues are presented, with extensive subject and author indexes. Offers a comprehensive view of ongoing research in the field for a readership of researchers, pharmacologists, and clinicians concerned with drug dependence and its treatment.

PB83-252791/GAA PC **A99**/MF **E04**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Wind and Seismic Effects. Proceedings of the Joint Panel Conference of the U.S.-Japan Cooperative Program in Natural Resources (11th).
Final rept.,
H. S. Lew. Jul 83, 755p NBS-SP-658
See also PB81-107393. Library of Congress catalog card no. 83-600550.

Keywords: *Bridges, *Buildings, *Earthquakes, *Wind pressure, Seismic waves, Gust loads, Earth movements, Dynamic structural analysis, Dynamic loads, Dynamic response, Soil mechanics, Tsunamis, Earthquake engineering.

The Eleventh Joint Meeting of the U.S. - Japan Panel on Wind and Seismic Effects was held in Tsukuba, Japan on September 4-7, 1979. The proceedings of the Joint Meeting include the program, the formal resolution and the technical papers. The subjects covered in the paper include the engineering characteristics of wind, the characteristics of earthquake ground motions, the earthquake response of structures, the wind response of structures, recent design criteria against wind and earthquake disturbances, the design and analysis of special structures, the evaluation, repairing, and retrofitting for wind and earthquake disaster, earthquake disaster prevention planning, storm surge and tsunamis, and technical cooperation with developing countries.

PB83-253971/GAA PC **E03**/MF **E03**
Transport and Road Research Lab., Crowthorne (England).
Value of Time Savings in West Malaysia: Car, Bus and Taxi Occupants,
S. Thomas. c1983, 25p TRRL-SR-777
Also pub. as ISSN-0305-1315.

Keywords: *Transportation management, *Transportation, Savings, Statistical data, Salaries, Highways, Utilization, Economic impact, *Malaysia, Taxicabs, Traffic volume.

This report examines the impact of a new inter-urban highway in West Malaysia on journey times and costs and on traffic volumes and trip frequency. The major benefit of the new highway is journey time savings and behavioural values for non-working time savings are calculated using mode choice analysis. The distribution of benefits between road users of different income groups is considered. (Copyright (c) Crown Copyright 1983.)

PB83-253989/GAA PC **E04**/MF **E04**
Transport and Road Research Lab., Crowthorne (England).
Performance of Surface Dressed Roads in Ghana,
P.W.D.H. Roberts. c1982, 34p TRR/SR-762
Also pub. as ISSN-0305-1315.

Keywords: *Maintenance, *Roads, *Pavements, Surface toughness, Texture, *Ghana.

This report describes the performance of selected lengths of sealed roads in Ghana. The roads were monitered over a period of two and a half years, during which time very little effective maintenance of the carriageways was undertaken. The results of detailed measurements of road surface condition are related to the quality of surface dressing on pavement deterioration is emphasized. Examples are given of the user cost savings that can result from road maintenance, and criteria are suggested for determining when maintenance interventions on surface dressed roads in Ghana are required. (Copyright (c) Crown Copyright 1982.)

PB83-254052/GAA PC **E03**/MF **E03**
Transport and Road Research Lab., Crowthorne (England).
Effects of Urban Traffic Control in Bangkok,
J.H. Jones, N.W. Marler, and A. J. Downing. c1982, 25p TRRL-SR-756
Also pub. as ISSN-0305-1315.

Keywords: *Urban planning, *Traffic engineering, Transportation management, *Transportation, Developing countries, Traffic surveys, Travel time, Traffic signals, *Thailand, Electronic traffic control.

The effects were monitored of a computerized urban traffic control system (UTC) which came into operation in May 1979 in the central area of Bangkok - a city with notorious traffic problems. Surveys were carried out in order to assess the effects of UTC on car and bus journey times, and on the proportion of drivers complying with red traffic signals. Changes in traffic demand between the two surveys were small, enabling valid conclusions about UTC performance to be drawn.

PB83-256891/GAA PC **A06**/MF **A01**
Transportation Research Board, Washington, DC.
Bridges and Culverts.
Transportation research record,
Michael J. Koob, John M. Hanson, C. P. Heins, I. C. Lin, and David B. Beal. 1983, 114p TRB/TRR-903, ISBN-0-309-03517-1
Library of Congress catalog card no. 83-17251. Also pub. in ISSN-0361-1981.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418.

Keywords: *Bridges, Bridge decks, Bridge piers, Cracking(Fracturing), Bridge abutments, Pipes(Tubes), Joints(Junctions), Bearings.

The 16 papers in this report deal with the following areas: field testing of the Fremont Bridge; seismic design of curved box girders; test to failure of the Hannacroix Creek Bridge; load factor design applied to truss members in design of Greater New Orleans Bridge No. 2; testing and design of longitudinal reinforcement for cantilevered bridge piers; study of cracking of composite deck bridge on I-75 over Peach River; performance of full-span panel-form bridges under repetitive loading; full-depth modular precast, prestressed bridge decks; abnormal rotations of skewed and curved bridges; skewed bridges with integral abutments; behavior of abutment piles in an integral abutment in response to bridge movements; effective coefficient of friction of steel bridge bearings; observations of highway bridge movements and their effects on joints and bearings; Caltrans prestressed concrete pipe culvert research: design summary and implementation; effect of heavy loads on buried corrugated polyetheylene pipe; and, computer modeling of the Cross Canyon Culvert.

PB83-257584/GAA PC **A04**/MF **A01**
General Accounting Office, Washington, DC. National Security and International Affairs Div.
Irrigation Assistance to Developing Countries Should Require Stronger Commitments to Operation and Maintenance.
29 Aug 83, 59p GAO/NSIAD-83-31, B-206848

Keywords: *Irrigation, *Technology transfer, *Technical assistance, Assessments, Financing, Operating costs, Maintenance, Project planning, Design, Recommendations, Indonesia, Sri Lanka, Thailand.

The United States, directly through the Agency for International Development and indirectly through the World and Asian Development banks, has invested billions of dollars in irrigation systems in Asia. Whether the recipient countries have the capability or commitment to operate these systems efficiently or to maintain them adequately is seriously questioned. GAO assessed the operation and maintenance of U.S.-financed irrigation systems in Indonesia, Sri Lanka, and Thailand. Recommendations are given in the report by GAO.

PB83-258681/GAA PC **A13**/MF **A01**
Work Glove Manufacturers Association, Grayslake, IL.
Work Glove Industry Technical Assistance Project.
Final rept. Sep 80-Jun 83.
Sep 83, 290p EDA-83-26-004
Grant EDA-99-26-07112-10

Keywords: *Technical assistance, Exports, Economic development, Standards, Technology assessment, Marketing, *Industrial development.

The diagnostic study was designed to identify those areas that offer the most potential for improving the competitive position of the U.S. work glove industry relative to foreign producers of work gloves, who are supplying a large and increasing volume of imports to the U.S. market.

PB83-260091/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Population and Family Planning in Bangladesh: A Survey of the Research.
Working paper,
Mohammad Alauddin, and Rashid Faruqee. c1983, 173p ISBN-0-8213-0150-0, WP-557
Library of Congress catalog card no. 83-1238.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Fertility, *Bangladesh, Mortality, Contraceptives, Surveys, *Family planning.

This survey attempts to do the following: (1) Provide an inventory of major studies on fertility trends, profiles, and determinants, and on family planning in Bangladesh; (2) Analyze the results of the studies and underline their operational significance for improving the population program in Bangladesh and for taking new initiatives; and (3) Provide a critique of the studies and suggest directions for future research. (Copyright (c) The World Bank.)

PB83-260117/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Evaluation of Shelter Programs for the Urban Poor. Principal Findings.
Working paper,
Douglas H. Keare, and Scott Parris. c1982, 123p ISBN-0-8213-0114-4, WP-547
Library of Congress catalog card no. 82-20289.

Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Housing, *Urban planning, Services, Developing Countries, Construction, Project management, Evaluation.

The World Bank has been lending to support the development and improvement of shelter for the urban poor since 1972. The sites and services and area upgrading projects supported have followed a model of progressive development based on the provision of tenure and basic services. One early feature of the program was a pilot scheme to evaluate four such projects in El Salvador, the Phillippines, Senegal and Zambia. This initial study commenced in mid-1975 and was concluded late in 1980. The conclusions of the detailed evaluation have confirmed that the experiment embodied in the first generation of Bank-supported urban shelter projects has been remarkably successful. Notwithstanding this general record of success, the projects have encountered some problems and produced some unexpected results. An analysis of projects successes and shortcomings supports recommendations that future projects endeavor to push standards and costs still lower, include explicit provisions and opportunities for rental arrangements and incorporate credit provisions more nearly tailored to the needs of targetted families.

PB83-260166/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Using Communication Support in Projects. The World Bank's Experience.
Working paper,
Heli H. Perrett. c1982, 78p ISBN-0-8213-0119-5, WP-551
Library of Congress catalog card no. 82-20023.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Telecommunications, Developing countries, Communicating, Economic development, Education, Radio broadcasting.

This paper has two purposes: first, to review what has been learned and experienced in project work concerning the use of planned communications to improve project implementation and help achieve project objectives; and second, to assist Bank staff and officials in the developing countries to which the Bank lends in deciding when and how to include communication support activities in Bank-financed projects. (Copyright (c) 1982, The World Bank.)

PB83-260570/GAA PC **E03**/MF **E03**
National Engineering Lab., East Kilbride (Scotland).
Casting Critical Components,
R. McCallum. c1982, 21p NEL-681
Sponsored in part by Department of Industry, London (England). Also pub. in ISSN-0305-1439.

Keywords: *Castings, Heat resistant alloys, Nickel alloys, Colbalt alloys, Iron alloys, Standards, Process control, Mechanical properties, Turbine components.

A number of high technology casting produced by the U.K. investment casting industry in nickel, cobalt and iron based alloys were examined. These castings illustrated the process capability in the field of sophisticated high-integrity components. Owing to the requirement of such components, emphasis was given to aero-engine components. As these components need to perform reliably under difficult operating conditions, the rigorous specifications, in-process controls, detailed testing and inspection procedures were considered. Consideration was also given to the use of this process for the production of components in industrial and marine gas turbines which are subject to serve environmental conditions. (Copyright (c) Crown Copyright 1982.)

PB83-260679/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Trade Policy for Developing Countries: A Background Study for World Development Report, 1979.
Working paper,
Donald B. Keesing. c1979, 277p IBRD-WP-353
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *International trade, Government policies, Foreign policy, Political systems, Exports, *Industrial development, Economic policy.

Part I is concerned mainly with trade policy for purposes of industrial development, e.g., how to expand manufactured exports along with production for the home market. Part II examines relationships of trade policy with social and political systems and goals, for example, its effects on poverty, and how it interacts with repression or redistribution. Part III looks at how to achieve a successful transition from an unsatisfactory to a desirable trade policy regime. (Copyright (c) 1979 by The World Bank.)

PB83-260687/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Trade Policy Issues for the Developing Countries in the 1980s: A Background Study for World Development Report, 1981.
Working paper,
Isaiah Frank. c1981, 59p IBRD-WP-478
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *International trade, Government policies, Tariffs, Negotiations, Economic policy.

The paper explores the relation between trade policy and 'industrial policy' and calls attention to points of conflict and compatability. Suggestions are offered for a revised approach to trade adjustment assistance. Other topics discussed are: efforts to achieve 'fair labor standards' in the third world and the implications of such standards for protectionism and for World Bank policy; trade among developing countries, including as assessment of the options for encouraging it through regional, preferential, and unilateral approaches; and trade in services, including the interest of the developing countries in current efforts to liberalize this sector, which has thus far been neglected in international trade negotiations. (Copyright (c) by the World Bank 1981.)

PB83-260703/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Bureaucratic Politics and Incentives in the Management of Rural Development.
Working paper,
Richard Heaver. c1982, 93p IBRD-WP-537, ISBN-0-8213-0084-9
Library of Congress catalog card no. 82-15947.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Rural areas, *Economic development, Government policies, Management, Incentives, Trends, Developing countries, Poverty.

Management problems in the implementation of rural development are analyzed from a bureaucratic political standpoint. Proposals for management improvement will fail if they do not take account of informal interests and the patterns of incentives and pressures these create. At present, these informal incentives often make it irrational for managers and field staff to implement poverty-oriented programs as planned. Tentative methods are put forward for assessing incentives in rural development bureaucracies, and various means of influencing the 'incentive environment' are explored, with the aim of making it make sense for bureaucrats to be more responsive to the needs of poor beneficiaries. (Copyright (c) The International Bank for Reconstruction and Development/The World Bank.)

PB83-260711/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Worker Adjustment to Liberalized Trade: Costs and Assistance Policies.
Working paper,
Graham Glenday, Glen P. Jenkins, and John C. Evans. c1980, 91p IBRD-WP-426
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *International trade, Marketing, Policies, Manufacturing.

This work in progress report is part of an inquiry being undertaken by the World Bank in conjunction with scholars from twelve industrial countries into the penetration of the markets of industrial countries by exports of manufactures from developing countries. The project seeks to establish the shares of industrial country markets held by the developing countries, changes in such shares in the 1970s, and why they vary among industry groups and countries. The aim is to assist developing and industrial countries to improve their policies through a better understanding of trade patterns and protectionist pressures. This analyzes the potential usefulness of properly designed worker adjustment policies, defines the measurement and empirical issues which must be addressed in designing specific programs, and points out the critical considerations for their implementation. Estimates of the government financial assistance required are provided for one region in Canada to illustrate the magnitudes involved. The paper concludes that economic welfare can be improved at home and abroad by appropriate worker adjustment programs. (Copyright (c) The World Bank 1980.)

PB83-260737/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Testing for the Direction of Exports: India's Exports of Manufactures in the 1970s.
Working paper,
Ashok Khanna. c1982, 52p IBRD-WP-538
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *India, *International trade, Developing countries, Protection, Capital, Labor estimates, Foreign trade.

The main hypothesis tested here is that the exports of a developing country, with an advanced manufacturing sector, will differ among destinations: the capital intensity of exports will be greater to the more labor abundant destinations, and the labor intensity of exports will be greater to the more capital abundant destinations. India's exports of manufactures for 1973 and 1978 were used for the analysis. The results generally corroborate the above hypothesis and also indicate that the direction of exports is sustained over time. (Copyright (c) The World Bank 1982.)

PB83-260745/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Economic Analysis of Rural Road Projects.
Working paper,
Curt Carnemark, Jaime Biderman, and David Bovet. Aug 76, 102p IBRD-WP-241
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Rural areas, *Roads, *Economic analysis, Developing countries, Highway transportation, Agriculture, Highway planning, Economic conditions, Trends.

The purpose of this paper is to set forth a general approach for the economic analysis of rural road projects. In this context, the paper discusses the shortcomings of traditional economic analyses of highway projects which have focuses on the quantification of road user savings. The paper points out that such an approach is specifically unsuitable for rural roads with low levels of traffic. The authors emphasize the interdependence of transport and agricultural production systems in the rural environment and argue that the analysis should focus on the mechanisms by which transport cost savings are translated into increased agricultural production and income. The critical questions to be answered are: who benefits from the transport cost savings, how will producers respond to these cost savings, and do other constraints exist which may prevent the full developmental impact of a road from materializing.

PB83-260943/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Philippines: Industrial Development Strategy and Policies.
World Bank country study.
c1980, 459p
Microfiche copies only. paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Economic development, *Philippines, Trends, Policies, Employment, Exports, Developing countries, Industries, *Industrial development, Industrial growth.

The Industrial Sector Mission which visited the Philippines in February 1979 dealt primarily with industrial policies and incentives, with a view to exploring ways in which the country can better achieve its objectives of broader and more rapid industrial growth, employment creation, export development, regional dispersion and stronger technological capacity. It also reviewed policies for the development of small and labor-intensive industries. Specific industries reviewed included steel, mechanical engineering, textile and food processing, and in less detail, cement, garments, footwear and furniture. (Copyright (c) The International Bank for Reconstruction and Development/The World Bank 1980.)

PB83-261222/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Renewable Energy Resources in the Developing Countries.
Jan 81, 40p
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Renewable energy, *Biomass, Wind energy generation, Solar energy, Technology, Hydroelectric power generation, Technology.

Renewable energy resources occur in nature, in the form of energy flows of indefinite duration, as opposed to mineral deposits of finite amount. Thus solar and wind energy, hydroelectric power and fuels of vegetable origin are regarded as renewables while mineral fuels are not. Many of the technologies for exploiting renewable energy resources rely on scientific and engineering principles that have been understood for decades, if not centuries. The recent growth of interest in the exploration of renewable energy resources in developing countries has been prompted by two main factors: the increased international price of oil and gas, and the alarmingly rapid depletion of fuelwood supplies in these countries. This paper examines the contributions that renewable resources can make to energy supplies in developing countries, and discusses the role of the World Bank in renewable energy development over the next five years.

PB83-261248/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
World Trade and Output of Manufactures: Structural Trends and Developing Countries' Exports.
Working paper,
Donald B. Keesing. c1979, 81p IBRD-WP-316
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *International trade, Production, Trends, Market shares, Foreign Trade.

Developing countries' manufactured exports increased from 1960 through 1976 at rates around 15% per year. This paper is concerned with the changing structural features of these exports and how they relate to world manufacturing output and markets, which have expanded much more slowly. Numerous relationships are explored, with speculative interpretations as well as tables. (Copyright (c) by The World Bank 1979.)

PB83-261313/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Shelter.
Poverty and basic needs series.
Sep 80, 45p
See also French version, PB83-261339, and Spanish version, PB83-261321.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Housing, Developing countries, *Health, *Nutrition, Water supplies, Disadvantaged groups, Poverty.

Despite the impressive level of economic growth the developing world has achieved over the past quarter century, some 800 million individuals there remain caught up in absolute poverty: a condition of life so limited by malnutrition, disease, illiteracy, low life expectancy, and high infant mortality as to be beneath any rational definition of human decency. The only practical hope, then, of reducing absolute poverty is to assist the poor to become more productive. The World Bank has put a major emphasis on that strategy in its lending operations over the last several years: projects specifically designed to enhance the earning power of the poor. A critical component of that approach is for governments of developing countries to provide better access for the absolute poor in their societies to essential public services, particularly basic education, primary health care, and clean water. These fundamental services--combined with the better shelter and nutrition that improved incomes can afford--are the key to the poor's being able to meet their own basic needs.

PB83-261321/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Vivienda (Shelter).
Poverty and basic needs series.
Sep 80, 51p
Text in Spanish. See also English version, PB83-261313, and French version, PB83-261339.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Housing, Developing countries, *Health, *Nutrition, Water supplies, Disadvantaged groups, Poverty.

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PB83-261339/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Logement (Shelter).
Poverty and basic needs series.
Sep 80, 51p
Text in French. See also English version, PB83-261313, and Spanish version, PB83-261321.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Housing, Developing countries, *Health, *Nutrition, Water supplies, Disadvantaged groups, Poverty.

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PB83-261347/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Meeting Basic Needs: An Overview.
Poverty and basic needs series.
Sep 80, 35p
See also Spanish version, PB83-261362, French version, PB83-261370, Japanese version, PB83-261388, and Arabic version, PB83-261354.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Social services, *Social change, Requirements, Economic growth, Housing, *Productivity, Health, Education.

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PB83-261354/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Meeting Basic Needs: An Overview.
Poverty and basic needs series.
Sep 80, 37p
Text in Arabic. See also English version, PB83-261347, French version, PB83-261370, Spanish version, PB83-261362, and Japanese version, PB83-261388.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Social change, *Social services, Requirements, Economic growth, Housing, *Productivity, Health, Education.

The only practical hope of reducing absolute poverty is to assist the poor to become more productive. The World Bank has put a major emphasis on that strategy in its lending operations over the last several years: projects specifically designed to enhance the earning power of the poor. A critical component of that approach is for governments of developing countries to provide better access for the absolute poor in their societies to essential public services, particularly basic education, primary health care, and clean water. These fundamental services--combined with the better shelter and nutrition that improved incomes can afford--are the key to the poor's being able to meet their own basic needs. In this situation the right kind of public services are those which not only reach the poor, but help them alter their personal circumstances so that their own inherent potential can be more fully realized.

PB83-261362/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Satisfaccion de las Necesidades Basicas: Examen General (Meeting Basic Needs: An Overview).
Poverty and basic needs series.
Sep 80, 38p
Text in Spanish. See also English version, PB83-261347, French version, PB83-261370, Japanese version, PB83-261388, and Arabic version, PB83-261354.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

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PB83-261370/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Besoins Essentiels: Document de Synthese (Meeting Basic Needs: An Overview).
Poverty and basic needs series.
Sep 80, 37p
Text in French. See also English version, PB83-261347, Spanish version, PB83-261362, Japanese version, PB83-261388, and Arabic version, PB83-261354.
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PB83-261784/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Urban Transport.
Sector policy paper.
May 75, 106p
See also French version, PB83-261792, and Spanish version, PB83-261800.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., Washington, DC. 20433.

Keywords: *Transportation, *Urban planning, *Transportation management, *Urbanization, Regulations, Coordination, Public transportation.

Contents:
- Current conditions in developing countries;
- The prospects for urban transport;
- Rationalizing the use of transport facilities;
- Promoting efficiency and coordination among agencies;
- Transport and urban form;
- Activities of the World Bank.

PB83-261792/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Transports Urbains (Urban Transport).
Sector policy paper.
1975, 122p
Text in French. See also English version, PB83-261784, and Spanish version, PB83-261800.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Transportation, *Urban planning, *Transportation management, *Urbanization, Regulations, Coordination, Public transportation.

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- Transport and urban form;
- Activities of the World Bank.

PB83-261800/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Transportes Urbanos (Urban Transport).
Sector policy paper.
1975, 122p
Text in Spanish. See also English version, PB83-261784, and French version, PB83-261792.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Transportation, *Transportation management, *Urbanization, Regulations, Coordination, Public transportation.

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- Rationalizing the use of transport facilities;
- Promoting efficiency and coordination among agencies;
- Transport and urban form;
- Activities of the World Bank.

PB83-261818/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Road Maintenance Problem and International Assistance.
Dec 81, 75p
See also French version, PB83-261834, and Spanish version, PB83-261826.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Roads, *Maintenance, Maintenance management, Rural areas, Problem solving, Recommendations.

This paper is an attempt to distill the results of the Bank's experience and of the research that it has conducted during the last ten years on the economics of highway construction and maintenance, with a view to identifying approaches and solutions that seem to work better than others. The focus is largely on the still unresolved problems of national highway maintenance; but since rural roads suffer, often to a magnified degree, from the same problems, they, too, can benefit from many of the measures suggested, although they often require approaches that mobilize more local or regional capacities and resources.

PB83-261826/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Problema del Mantenimiento Vial y la Asistencia Internacional (Road Maintenance Problem and International Assistance).
Dec 81, 93p
Text in Spanish. See also English version, PB83-261818, and French version, PB83-261834.

Keywords: *Roads, *Maintenance, Maintenance management, Rural areas, Problem solving, Recommendations.

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PB83-261834/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Probleme de l'Entretien Routier et l'Assistance Internationale (Road Maintenance Problem and International Assistance).
Dec 81, 93p
Text in French. See also English version, PB83-261818, and Spanish version, PB83-261826.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

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PB83-261958/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Infant and Child Mortality as a Determinant of Fertility. The Policy Implications.
Working paper,
Susan H. Cochrane, and K. C. Zachariah. c1983, 43p IBRD-WP-556, ISBN-0-8213-0147-0
Library of Congress catalog card no. 83-1105.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Fertility, *Children, Developing countries, Policies, Contraceptives, Birth control, Family planning, Cost effectiveness, Biological effects.

Contents:
- Introduction (unanswered policy questions);
- The channels--Theory and measurement The biological effects, Infant and child mortality experience on contraceptive use, The effect of infant and child mortality on parity);
- The cost-effectiveness of various programs for fertility reduction (Cost-effectiveness of family planning program;
- cost per birth averted through mortality reduction; caveats).

PB83-261974/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Pirate Subdivisions and the Market for Residential Lots in Bogota.
Working paper,
Alan Carroll. c1980, 126p IBRD-WP-435
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Urban planning, *Colombia, *Land use, Marketing, Land, Developing countries.

This paper deals with the market for pirate subdivision lots. Examining the pirate subdivision business is instructive because it is a unique case of large-scale, competitive land market for modest income families. The paper is divided into six parts. This introductory chapter is followed by a descriptive overview covering the general characteristics of the subdivisions studied, the purchase of tracts, infrastructure and development costs, and the sale of lots. The third chapter deals with rates of return to pirate and normas minimas developers. The fourth and fifth chapters are devoted to an analysis, based on hedonic price indexes, of the determinants of tract and lot prices, respectively. The final chapter presents conclusions and discusses policy issues related to the effectiveness of the normas minimas laws.

PB83-261982/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Trade in Non-Factor Services: Past Trends and Current Issues.
Working paper,
Andre Sapir, and Ernst Lutz. c1980, 144p IBRD-WP-410
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *International trade, *Econometrics, Models, Forecasting.

This paper represents the first stage of a research project on trade in non-factor services. It (a) presents and analyzes the available data on trade in non-factor services; (b) formulates a series of preliminary hypotheses on the factors affecting NFS trade and presents the results of econometric analyses which can be used for projections in the global model for the World Development Report; (c) discusses the impediments to NFS trade as seen by both developed and developing countries; (d) sets out issues which might be analyzed in the next stage of the project. (Copyright (c) The World Bank 1980.)

PB83-262030/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Tribal Peoples and Economic Development. Human Ecologic Considerations,
Robert Goodland. c1982, 121p ISBN-0-8213-0010-5
Library of Congress catalog card no. 82-11192.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Rural areas, *Migration, Population migrations, Requirements, Regional planning, Tribal practices.

It is estimated that, at present, there are approximately 200 million tribal people, roughly 4% of the global population. They are found in all regions of the world and number among the poorest of the poor. Until relatively recently, development planning had not adequately addressed the human, economic, and social aspects of the acculturation process. The World Bank has, therefore, taken a conscious, substantive look at the problems it has encountered, and may have to face in the future, in considerating projects in areas where tribal people live. The first chapter of this paper describes the problems associated with the development process as it affects tribal peoples. Subsequent chapters set forth why the Bank should be involved and outline the main requisites for meeting the human ecologic needs of tribal peoples. In Annex 1, the paper presents general principles that are designed to assist the Bank's staff and project designers in perceiving the issues and in incorporating timely measures. (Copyright (c) The World Bank 1982.)

PB83-262733/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Employment and Development of Small Enterprises.
Sector policy paper.
Feb 78, 95p
See also Spanish version, PB83-262741, and French version, PB83-262758.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Small businesses, *Industrial development, Industries, Fixed investment, Capitalized costs, Personnel, Unskilled workers.

Most developing countries are characterized by a rapidly growing population and labor force. While much of this labor force will be absorbed in traditional agriculture, it is clear that an increasing amount of labor will seek employment in nonfarm occupations--roughly two out of every three job seekers over the next 25 years. Some of these jobs may be found in villages and small towns, closely linked to developments in agriculture. A growing number, however, will have to be found in the larger towns and cities. Absorbing the growing labor force in productive employment is one of the principal challenges of development. The potential role of the Bank in assisting developing countries to expand the demand for urban labor is examined here. Capital is scarce in most developing couties so that in varying degrees, depending on a country's resources, capital has to be used as efficiently as possible to expand the demand for labor.

PB83-262741/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
El Empleo y el Desarrollo de las Pequenas Empresas (Employment and Development of Small Enterprises).
Sector policy paper.
Feb 78, 114p
Text in Spanish. See also English version, PB83-262733, and French version, PB83-262758.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Small businesses, *Industrial development, Industries, Fixed investment, Capitalized costs, Personnel, Unskilled workers.

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PB83-262758/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Emploi et Developpment de la Petite Entreprise (Employment and Development of Small Enterprises).
Sector policy paper.
Feb 78, 107p
Text in French. See also English version, PB83-262733, and Spanish version, PB83-262741.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Small businesses, *Industrial development, Industries, Fixed investment, Capitalized costs, Personnel, Unskilled workers.

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PB83-262766/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Opportunities for Biological Control of Agricultural Pests in Developing Countries,
D. J. Greathead, and J. K. Waage. c1983, 54p
WORLD BANK TECHNICAL PAPER-11, ISBN-0-8213-0164-0
Library of Congress catalog card no. 83-3601. Also pub. in ISSN-0253-7494.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Pest control, *Insects, *Agriculture, Assessments, Attractants, Ecology, Cereals, Root crops, Oilseed crops, Grain crops, Weed control, Fibres, Vegetables, Fruits, Nuts, Forage crops, Plantation crops, Integrated pest control.

Contents; Background and achievements of biological control; Implementation of biological control; Broad assessment of biological control potential; Biological control in major crops; Major pest problems affecting several crops; Weeds. (Copyright (c) 1983 The Internatinal Bank for Reconstruction and Development.)

PB83-262774/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC. Technology Advisory Group.
Model for the Development of a Self-Help Water Supply Program.
Working paper,
Colin Glennie. c1982, 59p WORLD BANK TECHNICAL PAPER-2, ISBN-0-8213-0077-6
Also pub. as International Bank for Reconstruction and Development, Washington, DC. Technology Advisory Group Working Paper No. 1. Library of Congress catalog card no. 82-15574.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Water management, *Water supply, *Sanitation, Manpower, Communities, Construction, Citizen participation, Management, Water wells, Education, Instructional materials, Personnel development, Self help program.

This working paper considers the manpower, training and institutional requirements of self-help water supply and sanitation programs. It is not possible to consider these issues in isolation from the overall nature of the program itself. The recommendations here would be of doubtful value if they were made sufficiently general to be applicable to any program in any country. Accordingly, the approach has been to consider a practical model for the development of a self-help program, and examine the issues of manpower, training and institutional requirements in relation to this model while discussing issues of parallel importance. This exercise provides a basis for considering what features of the model are applicable to other program models, and how they may be adapted accordingly. The paper describes a model which has taken a decade to develop in the field. Although the model has developed from a rural water supply program, many of the principal features are applicable to sanitation program development.

PB83-262782/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Environmental Considerations for the Industrial Development Sector.
Aug 78, 138p
See also French version, PB83-262808, and Spanish version, PB83-262790.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Environmental management, *Environmental surveys, *Industrial wastes, Developing countries, Standards, Sampling, Water pollution control, Air pollution control, Environmental impacts, Chemical analysis, Sources, Technology, Solid waste disposal, Bacteria, Microorganisms, Economic analysis, Environment management, Land pollution.

The purpose of this document is to provide guidelines for consideration and attention as an integral part of the industrial expansion and growth process. Past experience in many of the developed countries has shown that where little or no consideration was given to environmental protection during the industrial development period the correction of damages to the environment has been both slow and costly. The principles presented in this document are intended as general guidelines only. Since no two situations are exactly alike, modification may be necessary for application of these guidelines to specific circumstances.

PB83-262790/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Consideraciones Ambientales para el Sector de Desarrollo Industrial (Environmental Considerations for the Industrial Development Sector).
Aug 78, 161p
Text in Spanish. See also English version, PB83-262782, and French version, PB83-262808.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Environmental management, *Environmental surveys, *Industrial wastes, Developing countries, Standards, Sampling, Water pollution control, Air pollution control, Environmental impacts, Chemical analysis, Sources, Technology, Solid waste disposal, Bacteria, Microorganisms, Economic analysis, Environment management, Land pollution.

The purpose of this document is to provide guidelines for consideration and attention as an integral part of the industrial expansion and growth process. Past experience in many of the developed countries has shown that where little or no consideration was given to environmental protection during the industrial development period the correction of damages to the environment has been both slow and costly. While the material has been prepared primarily for use by the staff of The World Bank, its use by other institutions and agencies is both welcomed and encouraged. It is hoped that the document will be particularly helpful to administrators, managers, planners, environmentalists, and other officials--both public and private--concerned with industrial development. It is further hoped that for them the document will provide a useful orientation and guidance.

PB83-262808/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Protection de l'Environnement dans l'Industrie (Environmental Considerations for the Industrial Development Sector).
Dec 80, 145p
Text in French. See also English version, PB83-262782, and Spanish version, PB83-262790.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Environmental management, *Environmental surveys, *Industrial wastes, Developing countries, Standards, Sampling, Water pollution control, Air pollution control, Environmental impacts, Chemical analysis, Sources, Technology, Solid waste disposal, Bacteria, Microorganisms, Economic analysis, Environment management, Land pollution.

Critical to any nation's economic development is its growth in the industrial sector, generally accompanied by a shift of population from rural to urban areas and by the creation of new environmental hazards. The purpose of this document is to provide guidelines for consideration and attention as an integral part of the industrial expansion and growth process. Past experience in many of the developed countries has shown that where little or no consideration was given to environmental protection during the industrial development period the correction of damages to the environment has been both slow and costly.

PB83-262816/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Malnourished People: A Policy Review.
Poverty and basic needs series,
Alan Berg. Jun 81, 117p
See also French version, PB83-262824.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Diseases, *Nutrition, *Rural areas, Unemployment, Low income groups, Mortality, Policies.

Nutrition is fundamental to life, work, and well-being. Inadequate nutrition--or malnutrition--is responsible for human and economic waste of consequential proportions. In developing societies, malnutrition plays a part in substantial numbers of deaths, and inadequate diet and related illness interfere with the learning ability, capacity to work, behavior, and well-being of large segments of the populations. The nutritional state of the populace both influences and reflects the level and pace of national development. It is now apparent that the dominant malnutrition problem in large populations is insufficient intake of food energy, or calories, which is related essentially to the problem of inadequate income. Steps to increase the per capita incomes of the poor--ranging from increased employment to reduced population growth--will have a fundamental and powerful effect on a country's nutritional status. In the long run, nutritional improvement will depend largely on national economic growth and the pattern of that growth. But for most of the world's malnourished, the growth process is too slow. Even under optimistic growth assumptions, national growth would take much more than a generation to push nutrition to adequate levels. The process is long because per capita incomes of the poor increase slowly and because their energy intake rises less than half as rapidly.

PB83-262824/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Les Mal Nourris: Etude d'Ensemble (Malnourished People: A Policy View).
Poverty and basic needs series,
Alan Berg. Jun 81, 127p
Text in French. See also English version, PB83-262816.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Diseases, *Nutrition, *Rural areas, Unemployment, Low income groups, Mortality, Policies.

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PB83-262840/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Trade and Employment Policies for Industrial Development.
c1982, 72p ISBN-0-8213-0017-2
Library of Congress catalog card no. 82-8519.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Employment, *International trade, Commerce, Government policies, Economic development, Developing countries, *Industrial development, Economic policy.

The report examines the following issues: Whether good export performance is attributable to special characteristics of successful countries; whether the penetration of the markets industrial countries has reached its limits; and whether trade in manufactures among the developing countries can expand further.

PB83-262857/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Land Reform.
Sector policy paper.
May 75, 76p
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Land use, *Agriculture, Production, Food, Developing countries, *Economic development, Rural areas, Government policies. Land ownership.

While recognizing the broad context of the land reform issue, this paper focuses on a much narrower aspect--the appropriate role of the World Bank. In pursuing this question, Chapter 1 looks at the characteristics of land reform in terms of both its rural context and its component elements. Chapter 2 examines the economic implications of land reform in relation to the goals of development. Chapter 3 reviews the Bank's policy in relation to land reform. The quantitative background to land reform in terms of population patterns and land distribution is outlined in Annex 1, while some experiences with land reform programs are summarized in Annex 2. The policy guidelines are presented at the end of the Summary.

PB83-263061/GAA PC **A04**/MF **A01**
Office of Technology Assessment, Washington, DC.
Technologies and Management Strategies for Hazardous Waste Control.
Summary rept.
Mar 83, 57p OTA-M-197.
See also PB83-189241.

Keywords: *Waste disposal, *Industrial wastes, Technology, National government, Risks, Cost analysis, Regulations, Waste treatment, Substitutes, *Waste recycling.

This summary presents the findings and conclusions of OTA's analysis of the Federal program for the management of nonnuclear industrial hazardous waste--an issue that has now reached national prominence and widespread congressional attention. OTA's findings and conclusions concerning the technical components of the Federal hazardous waste program complement current activities which have focused more on administrative problems and issues. Our work offers a number of opportunities, at this critical time, for examining solutions to national hazardous waste problems. The focus of the study was to be on technological options for managing hazardous waste at operating facilities, technical means to address the problem of uncontrolled and possibly abandoned hazardous waste sites, and the technical adequacy of the Federal regulatory program.

PB83-263079/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Empresa Rural y el Empleo No Agricola (Rural Enterprise and Nonfarm Employment).
World Bank paper.
Jan 78, 99p
Text in Spanish. See also English version, PB83-263087.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Economic development, *Rural areas, Farms, Low income groups, Specialized training, Construction, Services, Transportation.

The origin of this paper lies in the concern of the Bank, in the course of its research and through its policy and operational work, to seek and promote ways of reducing the poverty of rural people by increasing the availability to them of economically productive employment and earnings opportunities. More specifically, this concern is reflected in Bank-assisted rural development projects, which provide a range of institutional, financial, and other supporting services to smallholder farmers. This paper examines: (1) the role of rural nonfarm activities in the development process; (2) the relevance of current and prospective forms of development assistance to the promotion of growth in and development of such activities; and (3) issues for Bank operations.

PB83-263087/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Rural Enterprise and Nonfarm Employment.
World Bank paper.
Jan 78, 90p
See also Spanish version, PB83-263079.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Employment, *Economic development, *Rural areas, Farms, Low income groups, Specialized training, Construction, Services, Transportation.

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PB83-263095/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Housing.
Sector policy paper.
May 75, 78p
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Urban planning, *Housing, Policies, Economic development, Low income groups, Urban sociology, Self help housing.

This paper approaches the housing situation from the standpoint of effective housing demand. The costs of dwelling units of varying sizes, standards and locations are compared with the ability of low income groups to pay. It is suggested that housing (including sites and services and other self-help methods of construction) could be provided without significant subsidy for at least 80% of the population of most cities. It appears that in relatively higher-income countries most of the lowest 20% could be reached with small subsides. In very large, lower-income cities is more difficult for the poorer segments of the population to be reached. In these instances, squatter area upgrading appears to hold the most promise.

PB83-263103/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Sante (Deuxieme Edition) (Health (Second Edition)).
Sector policy paper.
Feb 80, 103p
Text in French. See also English version, PB83-263111, and Arabic version, PB83-263129.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Health, *Diseases, *Nutrition, Government policies, Health status, Health services.

This paper briefly describes health conditions in developing countries, then examines some of the most common obstacles to improving them, the underlying sources of these obstacles, and the lessons of experience that will guide the Bank's activities in the sector. It concludes by outlining changes in Bank policy.

PB83-263111/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Health (Second Edition).
Sector policy paper.
Feb 80, 93p
See also French version, PB83-263103, and Arabic version, PB83-263129.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Health, *Diseases, *Nutrition, Government policies, Health status, Health services.

This paper briefly describes health conditions in developing countries, then examines some of the most common obstacles to improving them, the underlying sources of these obstacles, and the lessons of experience that will guide the Bank's activities in the sector. It concludes by outlining changes in Bank policy.

PB83-263129/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Health (Second Edition).
Sector policy paper.
Feb 80, 93p
Text in Arabic. See also English version, PB83-263111, and French version, PB83-263103.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Health, *Diseases, *Nutrition, Government policies, Health status, Health services.

This paper briefly describes health conditions in developing countries, then examines some of the most common obstacles to improving them, the underlying sources of these obstacles, and the lessons of experience that will guide the Bank's activities in the sector. It concludes by outlining changes in Bank policy.

PB83-263137/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Energy in the Developing Countries.
Aug 80, 105p
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Energy, Oils, Coal, Reserves, Natural gas, Forestry, Biomass, Hydroelectric power generation, Economic analysis, *Energy conservation, *Energy source development, Energy policy, Energy supplies, Energy demand.

The sharp rise in the cost of energy in recent years has underlined the urgent need to expand domestic energy production in developing countries that are dependent on imports. In 1980, they will spend almost US$50 billion on importing oil. By maximizing energy production between now and the end of the decade and by a vigorous program of energy conservation, the World Bank estimates that these countries could cut their oil-import bill in 1990 by $25-30 billion (1980 dollars). Measures outlined in the paper show it is possible to save about 15 percent of the energy needed in 1990, without having to reduce overall economic growth. It is also imperative that all countries, industrialized and industrializing, adjust their domestic energy prices, incentives, and investment priorities to place more emphasis than at present on domestic production.

PB83-263145/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Fishery.
Sector policy paper.
c1982, 88p ISBN-0-8213-0138-1
Library of Congress catalog card no. 82-23700.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Fisheries, Supply(Economics), *Aquaculture, Economic factors, Investments, Nutrition, Demand(Economics), Loans, Food consumption, Constraints, Marketing, Global.

Fishery is an important sector in most developing countries; in many cases, it contributes over 5 percent to the gross national product (GNP). Some 12 million fishermen are to be found in these countries, and at least an equal number are employed in related support and marketing activities. Fish is an important source of animal protein. The average per-capita consumption of fish currently exceeds thirteen kilograms a year. In Asia, over 1 billion people rely on fish for their primary source of protein. The total catch of fish in the world has remained fairly stable for the past decade at around 70 million metric tons yearly. It is estimated that this catch could increase to 120 million tons by managing heavily exploited stocks better and by intensified fishing of lightly harvested stocks. (Copyright (c) 1982 The International Bank for Reconstruction and Development/The World Bank.)

PB83-263426/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC. Economic Development Inst.
Agroindustrial Project Analysis.
EDI series in economic development,
James E. Austin. c1981, 225p ISBN-0-8018-2413-3
Library of Congress catalog card no. 80-550.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Project evaluation, *Agriculture, *Food processing, Developing countries, Project planning, Agricultural products, Fruits, Vegetables, Fibers, Manufacturing, Exports, Marketing, Cleaning, Investments.

The purpose of this book is to provide and illustrate a framework for analyzing and designing agroindustrial projects. It is written primarily for public sector analysts in developing countries, but it should also be useful to private sector managers financing or managing agroindustries. The analytical framework may also be helpful to organizations starting agroindustrial projects in more developed economies. This initial chapter will define agroindustry, introduce the analytical framework, and describe the scope of the book and the organization of the remaining chapters.

PB83-263434/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Appropriate Technology for Water Supply and Sanitation: Volume 1A. A Summary of Technical and Economic Options,
John M. Kalbermatten, DeAnne S. Julius, and
Charles G. Gunnerson. c1980, 56p
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Sanitation, *Water supply, *Sewage disposal, Developing countries, Assessments, Economic conditions, Public health, Social effect, Project planning, Septic tanks, Toilet facilities, Cost analysis, Diseases, Latrines.

This paper is a summarized version of the final report on appropriate technology for water supply and waste disposal in developing countries, a World Bank research project (RPO 671-46) undertaken by the Energy, Water and Telecommunications Department in 1976-1978. It reports the broad technical, economic, health, and social findings of the research and discusses the aspects of program planning necessary for their implementation. (Copyright (c) 1980 by the International Bank for Reconstruction and Development/The World Bank.)

PB83-263442/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Appropriate Technology for Water Supply and Sanitation: Sanitation Alternative for Low-Income Communities: Volume 1B. A Brief Introduction.
Duncan Mara. c1982, 58p
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Sanitation, *Sewage disposal, *Technology assessment, Assessments, *Waste water, Public health, Feces, Cost analysis, Urban areas, *Water wells, Toilet facilities, Water saving devices, Latrines.

This booklet is intended for economic, urban, and health planners; its purposes are to introduce in general non-technical terms the alternative sanitation technologies that are currently available for low-income urban communities in developing countries, and to present a suitable planning methodology for providing these communities with the sanitation facilities they need. This primary health objective can be fully achieved by sanitation technologies which are much simpler and cheaper than conventional sewerage; these technologies are described in the report.

PB83-263459/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Appropriate Technology for Water Supply and Sanitation: Night-Soil Composting,
Hillel I. Shuval, Charles G. Gunnerson, and DeAnne
S. Julius. c1981, 95p
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Sewage disposal, *Sewage treatment, Developing countries, Aerobic processes, Bacteria, Viruses, Public health, Collecting methods, *Sanitation, Water supply.

Among the problems facing those who depend on conservancy or other systems disposing separately grey water and night soil is the lack of a safe, inexpensive treatment method for night soil. In Kyoto, for example, night soil is collected hygienically to the satisfaction of users of the system, only to be diluted at a central collection point for discharge to the sewer system and treatment at a conventional sewage treatment plant. This paper reviews the state of the art on night-soil composting. The paper concludes that aerobic composting of night soil represents a method of treatment ideally suited for developing countries because of its simplicity in operation, limited need for mechanical equipment, low cost and its effectiveness in inactivating pathogens, thus assuring that the compost can be used without causing any public health hazard. (Copyright (c) 1981 by the International Bank for Reconstruction and Development/The World Bank.)

PB83-263467/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Appropriate Technology for Water Supply and Sanitation: Volume 3. Health Aspects of Excreta and Sullage Management. A State-of-the-Art Review,
Richard G. Feachem, David J. Bradley, Hemda
Garelick, and D. Duncan Mara. c1980, 331p
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Sanitation, *Water supply, *Sewage disposal, Developing countries, Project planning, Design, Feces, Public health, Sewage, Epidemology, Viruses, Bacteria, Septic tanks, Chlorination, Lagoons(Ponds), Aquaculture, Agriculture, Outfall sewers, Night soil.

Public Health is of central importance in the design and implementation of improved excreta disposal projects. Improvements in health are the main social and economic benefit which planners and economists hope to achieve by investing in excreta disposal. It is therefore necessary to make available as much information as possible about the interaction between excreta and health in order that engineers and planners may make informed and rational decisions. The information that is required not only concerns the broad epidemiological issues of the impact on disease of improvements in excreta disposal, but also the ways in which particular excreta disposal and reuse technologies affect the survival and dissemination of particular pathogens. This book sets out to provide such information. It is intended for planners, engineers, economists and health workers. (Copyright (c) 1980 by the International Bank for Reconstruction and Development/The World Bank.)

PB83-263483/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Outlook for Primary Commodities.
Working paper.
c1983, 174p IBRD-WP-9, ISBN-0-8213-0142-X
Library of Congress catalog card no. 82-23885.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *International trade, Commerce, *Marketing, Demand(Economics), Foreign trade.

This paper examines the short and medium-term price and trade outlook for the primary commodities that are of special interest to developing countries. It represents a result of the in-depth review of market prospects for primary commodities that the Commodities and Export Projections Division of the World Bank conducts every two years. It provides an overview of the macro-economic assumptions which were taken as a basis for the forecasts, a summary of the main results of the forecasts and a discussion of some of the key implications of the forecast exercise and policy issues that arise from the analysis. (Copyright (c) 1983 by The World Bank.)

PB83-263491/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Phillippines: Housing Finance.
World Bank country study.
c1982, 161p ISBN-0-8213-0108-X
Library of Congress catalog card no. 82-17607
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Philippines, *Financial management, *Housing, Trends, Economic conditions, Residential buildings, Construction industry, Demand(Economics), Finance, Financial management, Government policies, Developing countries, Mortgages.

A World Bank mission visited the Philippines during October 1981 to review selected aspects of housing finance in the country. In particular, the mission looked at recent developments in light of the need to increase the flow of funds into the housing sector and improve access to such funds through the formal financial sector. This report focuses on three interrelated sets of issues, namely resource mobilization and the macroeconomic implications; development of institutions and instrments for housing finance; and the rationalization of the institutional structure. Rather than design an ideal system for an ideal world, the emphasis is on feasible systems, and how best to improve them, taking the political economy of the sector as given.

PB83-263855/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Village Water Supply.
World Bank paper.
Mar 76, 99p
Microfiche copies only. Paper copy available from World Bank, 1818 H St., Washington, DC. 20433.

Keywords: *Water supply, *Rural areas, Cost analysis, Investments, Design, Sewage disposal, Financial management, Payment, Decision making, Citizen participation, Sanitation, Government policies, Priorities.

This paper deals with the supply of water for domestic use--not for irrigation--in the rural areas of the developing world. Probably over 1,000 million people in rural areas do not have an adequate water supply, and the rate at which access to safer water is being provided is too slow to keep pace with population growth. The majority of people without safe water live in developing countries of Asia, which also contain the largest numbers of the rural poor. In these countries, waterborne or water-related diseases are among the three major causes of sickness and death. Governments of developing countries are becoming increasingly concerned with improving living conditions in rural areas. The World Bank, too, has been shifting the emphasis of its lending program so as to have a greater impact on the rural population through projects in agriculture and integrated rural development. Rural water supply and sanitation should be a significant component of these projects. This paper concentrates on the problems peculiar to this subsector and suggests ways to begin to overcome the current state of neglect.

PB83-263871/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Colonizacion de Tierras Agricolas (Agricultural Land Settlement).
World Bank issues paper.
Jan 78, 89p
Text in Spanish. See also English version, PB83-263863.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Land use, *Agriculture, *Rural areas, Manpower, Population growth, Policies, Cost analysis, Employment, Income, Irrigation, Loans.

This paper discusses selected issues related to the World Bank's lending for land settlement, based on its own experience and that of other organizations. The presumption is that broad, generally applicable policies can be framed even though most settlements are suited to a particular set of conditions in a country or region. A relatively simple definition of settlement is used--the planned or spontaneous movement of people to areas of underutilized agricultural potential, both rainfed and irrigated.

PB83-263889/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Education (Third Edition).
Sector policy paper.
Apr 80, 150p
See also French version, PB83-263897, and Spanish version, PB83-263905.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Education, *Financial management, Financing, Policies, Grants, Students, Services, Specialized training.

The paper updates the Bank's interpretation of educational development and outlines a framework of policy for lending to education. The paper is divided into two major parts: the first deals with issues and trends in the development of education (Chapters 1-7), and the second describes the past and future policies and programs of lending by the Bank for education (Chapters 9 and 10) within the context of overall external aid to education (Chapter 8).

PB83-263897/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Education (Troisieme Edition) (Education (Third Edition)).
Sector policy paper.
Apr 80, 161p
Text in French. See also English version, PB83-263889, and Spanish version, PB83-263905.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Education, *Financial management, Financing, Policies, Grants, Students, Services, Specialized training.

The paper updates the Bank's interpretation of educational development and outlines a framework of policy for lending to education. The paper is divided into two major parts: the first deals with issues and trends in the development of education (Chapters 1-7), and the second describes the past and future policies and programs of lending by the Bank for education (Chapters 9 and 10) within the context of overall external aid to education (Chapter 8).

PB83-263905/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Educacion (Tercera Edicion) (Education (Third Edition)).
Sector policy paper.
Apr 80, 169p
Text in Spanish. See also English version, PB83-263889, and French version, PB83-263897.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Education, *Financial management, Financing, Policies, Grants, Students, Services, Specialized training.

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PB83-263913/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC. Economic Development Inst.
Municipal Water Supply Project Analysis: Case Studies,
Frank H. Lamson-Scribner ,Jr., and John W. Huang.
1977, 520p
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Sewage disposal, *Water supply, *Urban planning, Cost analysis, Appraisals, Water resources, Agriculture, Proposals, Benefit cost analysis, Accounting, Reservoirs, Water consumption, Discounted cash flow, Return on investment, Investments, Tables(Data), Maps, Water supply projects.

Contents:
- General case studies;
- Sector studies, master plans and demand forecasting;
- Discounting and its applications;
- Accounting and finance;
- Water rate structures and pricing;
- Economic analysis;
- Project management.

PB83-264093/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Emerging Energy and Chemical Applications of Methanol: Opportunities for Developing Countries.
c1982, 91p ISBN-0-8213-0018-0
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Methanol, *Cost benefits, *Fuels, Biomass, Utilization, Blends, Gasoline, Technology, Cost analysis, Marketing, Economic analysis, Fuel consumption, Spark ignition engines, Gasohol.

Contents:
- Characteristics of methanol;
- Chemical and fuel uses of methanol: an overview;
- Current and potential chemical uses of methanol;
- Current and potential uses of methanol in spark-ignition engines;
- Other potential fuel uses of methanol;
- Methanol technology, raw materials, and production costs;
- Supply, demand, and price prospects for methanol;
- Opportunities for developing countries;
- Policy issues and world bank role.

PB83-264143/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Alcohol Production from Biomass in the Developing Countries.
Sep 80, 85p
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Biomass, *Fuels, *Ethanol, Fuel consumption, Manufacturing, Technology, Sugars, Starches, Celluloses, Capitalized costs, Economic analysis, Operating costs, Technology, Process charting, Utilization, Land use, Agricultural products, Alternate fuels, Chemical feedstocks, Renewable energy sources.

Contents:
- Principal abbreviations and acronyms used;
- Characteristics of ethanol;
- Current and potential uses;
- Production and consumption of ethanol;
- Biomass raw materials for ethanol production;
- Ethanol production technology;
- Capital costs of alcohol plants;
- Economics of ethanol production and use;
- Prospects for alcohol production in developing countries;
- Policy issues related to alcohol production in the developing countries;
- Role of the World Bank.

PB83-264242/GAA PC **A11**/MF **A01**
Florida Univ., Gainesville. Inst. of Food and Agricultural Sciences.
Ecological Impact of Integrated Chemical and Biological Aquatic Weed Control,
Jerome V. Shireman, William T. Haller, Douglas E. Colle, Curtis E. Watkins, III, and Douglas F. DuRant.
Sep 83, 240p EPA-600/3-83-098
Grant EPA-R-805497

Keywords: *Weed control, *Ecology, *Water pollution, Hydrology, Lakes, Sampling, *Aquatic plants, Phytoplankton, Aquatic animals, Fishes, Zooplankton, Sites, Ponds, Nutrients, Tables(Data), *Water quality, Environmental effects, Organic loading.

This final report presents results of a four-year study of the ecological impacts of chemical, biological, and integrated methods of aquatic weed control. Biological and water quality changes occurred as abundance of macrophytic vegetation was altered by natural factors or management practices. Macrophyte abundance strongly influenced the structure of communities, and it was concluded that environmental effects of plant management programs are determined more by the amount of vegetation controlled than by management technique. Also, changes in lake hydrology and rates of nutrient loading appear to be more important as determinants of lake water quality than macrophytes. Research needs for evaluation of effects of weed control on aquatic systems are identified.

PB83-264358/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Forestry.
Sector policy paper.
Feb 78, 68p
See also French version, PB83-264374, and Spanish version, PB83-264366.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Economic development, *Forestry, Project planning, Exploitation, Wood products, Food, Fuels, Stream flow, Industries, Pulpwood, Catch basins, Soil stabilization, Area, Population growth, Wildlife, Recreation, Global, Habitats.

Forests play a significant role in economic development. In addition to their important influence on the environment, they provide innumerable products of vital use to man. The ecological usefulness of forests is most readily observed in their beneficial effect on water catchment areas, where they have a regulatory influence on stream flows and where they protect soils from erosion and prevent silting of dams and canals. They have pronounced microclimatic effects of benefit to humans and livestock, provide a habitat for wildlife, and are attractive places for recreation.

PB83-264366/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Politica Forestal (Forestry).
Sector policy paper.
Feb 78, 79p
Text in Spanish. See also English version, PB83-264358, and French version, PB83-264374.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Economic development, *Forestry, Project planning, Exploitation, Wood products, Food, Fuels, Stream flow, Industries, Pulpwood, Catch basins, Soil stabilization, Area, Population growth, Wildlife, Recreation, Global, Habitats.

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PB83-264374/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Foresterie (Forestry).
Sector policy paper.
Feb 78, 79p
Text in French. See also English version, PB83-264358, and Spanish version, PB83-264366.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Economic development, *Forestry, Project planning, Exploitation, Wood products, Food, Fuels, Stream flow, Industries, Pulpwood, Catch basins, Soil stabilization, Area, Population growth, Wildlife, Recreation, Global, Habitats.

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PB83-264382/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Agricultural Extension: The Training and Visit System,
Daniel Benor, and James Q. Harrison. c1977, 66p
ISBN-0-8213-0202-7
See also French version, PB83-264408, and Spanish version, PB83-264390.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Agriculture, *Education, *Agricultural Extension Services, Organizations, Services, Personnel, Evaluation, Instructions, Farms, Credit, Incentives, Requirements, Reforms.

This paper describes the Training and Visit System of Extension developed by Daniel Benor, which has been introduced in projects assisted by the World Bank in a number of countries with good results. In India, it has been found very effective when introduced throughout the area served by specific irrigation projects; it is now being rapidly broadened in scope by a number of statewide extension projects serving both irrigated and rainfed agriculture.

PB83-264390/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Extension Agricola: Sistema de Capacitacion y Visitas (Agricultural Extension: The Training and Visit System),
Daniel Benor, and James Q. Harrison. May 77, 73p
Text in Spanish. See also English version, PB83-264382, and French version, PB83-264408.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Agriculture, *Education, *Agricultural Extension Services, Organizations, Services, Personnel, Evaluation, Instructions, Farms, Credit, Incentives, Requirements, Reforms.

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PB83-264408/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Vulgarisation Agricole: Le Systeme de Formation et de Visites (Agricultural Extension: The Training and Visit System),
Daniel Benor, and James Q. Harrison. May 77, 72p
Text in French. See also English version, PB83-264382, and Spanish version, PB83-264390.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Agriculture, *Education, *Agricultural extension services, Organizations, Services, Personnel, Evaluation, Instructions, Farms, Credit, Incentives, Requirements, Reforms.

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PB83-264689/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC. Urban Development Dept.
Environmental Management of Urban Solid Wastes in Developing Countries: A Project Guide,
Sandra J. Cointreau. c1982, 224p TECHNICAL PAPER-5, ISBN-0-8213-0063-6
Library of Congress catalog card no. 82-13433. Also pub. as ISSN-0253-3324.
Microfiche copies only. Paper copy available from World Bank, 1818 H St. NW, Washington, DC. 20433.

Keywords: *Waste management, *Waste disposal, *Urban planning, Hazardous materials, Sources, Management planning.

The project guide provides information and procedures for planning and implementation of solid waste management improvements. It is designed to facilitate project preparation, appraisal and implementation of Bank financed solid waste projects in urban areas. Current Bank objectives, policies, and project requirements are summarized. It should also be of use to a wide audience involved in solid waste collection and disposal in developing countries. The project guide reflects the lessons and experience gained from World Bank solid waste projects. The text discusses establishment of an acceptable standard of collection and disposal service delivery, selection of appropriate technology, development of suitably phased action plans, arrangement of institutions for planning and management, arrangement of financial resources, development of regulatory and enforcement support services, provision of public education and participation programs, and incorporation of incentives and disincentives to facilitate project success.

PB83-264697/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Technology and Science in World Bank Operations.
c1982, 251p ISBN-0-8213-0058-X
Library of Congress catalog card no. 82-7071.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Financial management, *Economic development, Investments, Grants, *Technology transfer, Productivity.

The primary function of the Bank is to promote the economic growth and productivity of developing countries; it does this by financing investment projects of high priority. The focus on investment gives the Bank important strengths in dealing with science and technology. The Bank has four basic technological objectives: (1) To ensure that the most appropriate technologies are used in the projects it finances; (2) To promote the development of technological capacity in developing countries; (3) To promote the generation, diffusion, and application of innovative technologies needed to solve development problems, especially those of the poor; and (4) To promote the adoption by developing countries of national policies that can foster local technological capacity and lead to the use of technologies suited to local conditions, especially to the needs of the poor. The Bank is in a position to render a substantial service to developing countries in working to achieve these four objectives. (Copyright (c) 1982 The World Bank.)

PB83-264705/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC. Urban Development Dept.
Designing the Site and Service Plot Allocation Process: Lessons from Project Experience,
Lauren E. Cooper. c1982, 49p TECHNICAL PAPER-3
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Urban planning, *Land use, Urban development, Developing countries, Land, Allocations, Households.

This analysis provides a framework in which to identify and trace the steps required to implement the site and service plot allocation process. Based on a survey of 12 urban development projects and two in-depth project studies, a detailed picture emerges of the factors associated with allocating plots and the relationships and interdependencies of one factor to another. Potential problem areas and recommendations on how to avoid them are identified.

PB83-264713/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC. Urban Development Dept.
House Registration Handbook: A Model for Registering Houses and Plots in Unplanned Settlements,
Saad Yahya. c1982, 86p TECHNICAL PAPER-4, ISBN-0-8213-0053-9
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Urban planning, *Houses, Guidelines, Developing countries, Houses, Land, Census.

This manual has been prepared in response to the pressing need for a simple set of guidelines for preparing a list of houses and plots, their characteristics, and who owns them in squatter colonies and similar unplanned settlements. Because such an inventory can be used for a variety of purposes, such as community planning, local taxation, estate management and services delivery, it is important that relevant information be collected and compiled in a form that could meet varied objectives. The manual is divided into three parts, the first dealing with the objectives of registration and the persons and organizations that could benefit from a registration scheme. The second part deals with standards and performance criteria, in technical, social and economic terms. The final part, which is the backbone of the manual, outlines the range of available techniques for carrying out the fieldwork and compiling the data in a form that is useful to officials as well as to members of the public. The organizational and legal aspects are also discussed in this part.

PB83-264747/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Ownership a Efficiency in Urban Buses.
Working paper,
Charles Feibel, and A. A. Walters. c1980, 26p IBRD-WP-371
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Buses(Vehicles), *Transportation, *Transportation management, Productivity, Urban areas, Efficiency, Developing countries, Ownership, Public transportation.

Efficiency in urban bus operation depends on, among other things, the institutional form of the bus business. For certain cities in LDCs where there are parallel private and publicly owned operations, it is demonstrated that the costs of private provision are between 50 percent to 60 percent of those of publicly owned concerns. Additional evidence is adduced to show that the quality of private bus services is not markedly inferior and usually superior to the public bus operation. (Copyright (c) 1980 The World Bank.)

PB83-264762/GAA MF **E04**
International Bank for Reconstruction and Development, Washington, DC.
Agricultural Project Analysis: Case Studies and Exercises.
Jan 79, 688p
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Project evaluation, *Economic development, *Rural areas, Instructional materials, Agriculture, Specialized training.

This is a collection of case studies and exercises on agricultural project preparation and analysis. All materials for the present publication were developed for and used in the rural development and rural credit courses offered by the Institute. This publication consists of three volumes. The first volume is devoted to Problems. Volumes 2 for Leader's Guides and Scripts and 3 for Solutions are available upon application to the Coordinator, Training Materials and Publications, EDI. All of the case studies and most of the exercises included in this collection are based on actual projects in developing countries. They have been continuously revised to incorporate suggestions of the course participants and other users.

PB83-265264/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Agricultural Research.
Sector policy paper.
Jun 81, 116p
See also French version, PB83-265272, and Spanish version, PB83-265280.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Research and development, *Agricultural economics, *Agriculture, *Economic development, Rural areas, Investments, Loans, Policies, Production.

A basic premise of this paper is that carefully implemented agricultural research can be an efficient source of economic growth and is an important contributor to the achievement of key development objectives. Adequate food for the world's population over the next two decades requires increases in production at a rate of 3 to 4 percent a year in most developing countries and average increases in yield on already-cropped land of no less than about 2 percent yearly. For much of the developing world, it can be concluded, investment must be significantly expanded to improve the capacity to conduct agricultural research if these targets are to be achieved. The objective of the paper is to provide information and policy guidance of relevance to those efforts.

PB83-265272/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Recherche Agricole (Agricultural Research).
Sector policy paper.
c1983, 132p ISBN-0-8213-0160-8
Text in French. See also English version, PB83-265264, and Spanish version, PB83-265280.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Agriculture, *Research and development, *Agricultural economics, *Economic development, Rural areas, Investments, Loans, Policies, Production.

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PB83-265280/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Investigaciones Agronomicas (Agricultural Research).
Sector policy paper.
c1983, 137p ISBN-0-8213-0161-6
Text in Spanish. See also English version, PB83-265264, and French version, PB83-265272.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Agriculture, *Research and development, *Agricultural economics, *Economic development, Rural areas, Investments, Loans, Policies, Production.

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PB83-265298/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Sites and Services Projects.
World Bank paper.
Apr 74, 52p
See also French version, PB83-265314, and Spanish version, PB83-265306.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Housing, *Urban planning, Urban areas, Grants, Low income groups.

The paper should be regarded more as a framework in which to consider individual projects than as a manual providing specific directives for design or evaluation. As Bank financing can only provide a marginal contribution to the total of investment in urban dwellings and services required in developing countries, it follows that for a significant impact to be made, the site and services projects must be capable of repetition on a much wider scale without such assistance. This means that: (1) the projects must provide a package of benefits that is widely accepted by potential occupants as well worth the charges made; (2) such charges must be small, rentals or mortgage payments not exceeding a limited proportion, generally about 20%, of the income of occupants; (3) any costs not covered by the occupants must be within the capacity of the public authorities to bear on the scale of a large continuing program.

PB83-265306/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.

Proyectos de Lotes y Servicios (Sites and Services Projects).
World Bank paper.
Apr 74, 61p
Text in Spanish. See also English version, PB83-265298, and French version, PB83-265314.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Housing, *Urban planning, Urban areas, Grants, Low income groups.

The paper should be regarded more as a framework in which to consider individual projects than as a manual providing specific directives for design or evaluation. As Bank financing can only provide a marginal contribution to the total of investment in urban dwellings and services required in developing countries, it follows that for a significant impact to be made, the site and services projects must be capable of repetition on a much wider scale without such assistance. This means that: (1) the projects must provide a package of benefits that is widely accepted by potential occupants as well worth the charges made; (2) such charges must be small, rentals or mortgage payments not exceeding a limited proportion, generally about 20%, of the income of occupants; (3) any costs not covered by the occupants must be within the capacity of the public authorities to bear on the scale of a large continuing program.

PB83-265314/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Projets de Trames d'Accueil (Sites and Services Projects).
World Bank paper.
Apr 74, 56p
Text in French. See also English version, PB83-265298, and Spanish version, PB83-265306.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Urban planning, *Housing, Urban areas, Grants, Low income groups.

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PB83-265348/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Papua New Guinea: Selected Development Issues.
World Bank country study,
Alice Galenson, Friedrich Kahnert, Glenn Lehmann, Linda Likar, and Mudiayi Ngandu. c1982, 302p
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Economic development, *Papua New Guinea, Developing countries, Government policies, *Agriculture, Income, Employment, Forestry, Fisheries, Industries, *Industrial development.

This report begins with a statement of the Government's development objectives and an assessment of its major achievements. It then outlines some areas that are causing concern and identifies the key problems. The bulk of the report focuses on these major problem areas. Beginning with human resources, the report highlights the need to create more income earning opportunities and suggests changes in the wage policies that have constrained the demand for labor. It then turns to trained manpower constraints, with some recommendations for overcoming skill shortages in the economy. Continuing with the country's productive capability, the report explores PNG's agricultural potential and suggests policies and programs to promote growth in that sector. Industry, while not a major source of employment at present, will become increasingly important, particularly in urban areas. The report examines policies in the industrial sector and suggests ways to ensure that its development follows a rational economic path, without excessive reliance on protection or a distortion of incentives in the economy. (Copyright (c) 1982 The International Bank for Reconstruction and Development/The World Bank.)

PB83-265371/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC. Commodities and Export Projections Div.
International Cotton Market Prospects,
M. Elton Thigpen, and Maw-Cheng Yang. Jun 78, 79p COMMODITY PAPER-2
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Agricultural economics, *Cotton, *Fibers, Fiber crops, Developing countries, Trends, Supply(Economics), Consumption, Mills, Manufacturing, Cotton fabrices, Trends.

This paper is one in a series of periodic assessments of the current state and prospects of the world cotton economy. Its main purpose is to provide a revised framework for making long-term demand and supply forecasts for cotton. The paper also aims at providing a global perspective against which Bank lending policies in cotton can be evaluated. Finally, the paper attempts to bring together the considerable amount of information on cotton consumption, production and trade that has become available in the recent past.

PB83-852418/GAA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Preventive Medicine: Hazardous Materials Exposure and Public Health. 1976-October, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Oct 82.
Oct 82, 270p*
Supersedes PB82-859216.Prepared in cooperation with the Department of Energy, Washington, DC.

Keywords: Hazardous materials, Occupational diseases, Radioprotection agents, Health risks, Radioprotection, *Occupational safety and health, Environmental health, *Toxic substances.

This bibliography covers medical criteria, measures, and procedures for preventing or protecting human populations from health hazards or risks due to casual, therapeutic, or occupational exposure to hazardous materials and toxic substances in natural, medical, and industrial environments. The energy and health care industries are emphasized. (This updated bibliography contains 260 citations, 77 of which are new entries to the previous edition.)

PB83-861286/GAA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Industrial Energy Management. June, 1976-February, 1983 (Citations from the Energy Data Base).
Rept. for Jun 76-Feb 83.
Feb 83, 293p*
Supersedes PB82-857012.Prepared in cooperation with the Department of Energy, Washington, Washington, DC.

Keywords: *Energy management, Industrial sector, *Energy conservation.

This bibliography contains citations concerning techniques and technology for the management of industrial and commercial energy utilization. Topics include planning and monitoring of energy conservation systems and apparatus as well as the training of energy managers. Attention is also given to analyses of specific industries and specific facilities with regard to energy management. (This updated bibliography contains 302 citations, 82 of which are new entries to the previous edition.)

PB83-869685/GAA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Animal Offal in the Manufacture of Meat Products. 1972-July, 1983 (Citations from the Food Science and Technology Abstracts Data Base).
Rept. for 1972-Jul 83.
Jul 83, 283p*
Supersedes PB81-882094.Prepared in cooperation with the International Food Information Service, Frankfurt am Main (Germany, F.R.).

Keywords: *Food processing, Food storage, Nutritive value, Microbiology.

This bibliography contains citations concerning the utilization of edible animal offal for direct sale and in the manufacture of meat products such as frankfurters, sausages, lard and protein concentrates. The microbiology, keeping quality, nutritional value, and acceptability of these products are considered. Equipment for processing is also included. (This updated bibliography contains 293 citations, 81 of which are new entries to the previous edition.)

PB84-100189/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Urban Growth and Economic Development in the Sahel.
World Bank staff working paper,
M. A. Cohen, S. A. Agunbiade, D. Antelin, and A. de Mautort. c1979, 129p WP-315
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Economic development, *Sahel, *Urban planning, Developing countries, Urban areas, Employment, Industries, Rural areas, Africa.

This essay attempts to formulate answers to the problem by examining the following questions: What are the factors generating and supporting urban growth in the Sahel. Will urban growth continue. If so, how can urban growth be transformed from an essentially parasitic into a more generative process. What are realistic policy objectives for the medium and long term. What are the constraints to achieving them. And finally, what do we need to know to answer these questions. Chapter II presents an historical overview of the urbanization process in the Sahel, introducing the traditional Sahelian cities, the effects of national independence on urban growth, and past patterns of urban bias in national investment plans. Chapter III reviews the available demographic projections for the Sahelian countries, focusing on expectations for continued migration and urban growth. Chapter IV examines the rural sector in some detail in order to first understand the reasons for rural out-migration and the limited prospects of increasing rural incomes in the short term. Chapter V then evaluates the absorptive capacity of the urban sector in the face of expected urban growth. The last chapter proposes an operational strategy for urban policy change and urban investment.

PB84-101021/GAA PC **A03**/MF **A01**
Bureau of Reclamation, Denver, CO. Engineering and Research Center.
Concrete Tensile Strength Study,
E. L. Ore. Apr 83, 30p REC-ERC-81-5

Keywords: *Concrete, Tensile strength, Aggregates, Admixtures, Compressive strength, Water cement ratio, Cements, Fly ash.

Construction of double-curvature, thin-arch dams prompted an acute interest in the tensile strength, both static and dynamic, of concrete. The influence on tensile strength of such variables as specimen size and shape, aggregate size and shape, cement content, and water-reducing admixtures was questioned. This report considers only static tensile strength. Many indirect methods, whereby tensile strength is derived rather than measured, were studied and it was apparent that the - splitting test - was the best substitute for the direct method. Constituents used for this study included aggregates from three sources graded to 19-, 37.5-, 75-, and 100-mm (3/4-, 1 1/2-, 3-, 4-in) maximum size, two cements, one fly ash, and one WRA. Two specimen sizes and configurations were used.

PB84-101526/GAA PC **A02**/MF **A01**
Robert S. Kerr Environmental Research Lab., Ada, OK.

Biotransformation of Selected Organic Pollutants in Ground Water.
Journal article,
J. T. Wilson, J. F. McNabb, B. H. Wilson, and M. J. Noonan. 1983, 11p EPA-600/J-83-042
Pub. in Developments in Industrial Microbiology 24, p225-233 1983.

Keywords: *Ground water, *Water pollution, Chloroform, Tetrachloroethylene, Toluene, Chlorobenzene, Styrene, Public health, Sampling, Bacteria, Halogen organic compounds, Reprints, Ethane/dichloro, Ethane/trichloro, Ethylene/trichloro, Microcosms, Pickett(Oklahoma), Fort Polk(California), Los Angeles(California).

Widespread contamination of ground water by a variety of synthetic organic compounds has created a need for information about the biotransformation of these contaminants in aquifers and associated regions of the unsaturated subsurface. Uncontaminated samples of the subsurface were taken from positions immediately above and below the water table at Pickett, OK, and Fort Polk, LA. Selected organic pollutants were added aseptically to the samples at an initial concentration of 1 mg/liter water. Microbes in the deeper subsurface can degrade some, but not all, of the organic pollutants commonly encountered in ground water.

PB84-102540/GAA PC **A11**/MF **A01**
Systems Applications, Inc., San Rafael, CA.
Human Exposure to Atmospheric Concentrations of Selected Chemicals. Volume 1.
Interim rept.,
G. E. Anderson. Sep 83, 230p
Contract EPA-68-02-3066
Supersedes PB81-193252, and PB81-193260.

Keywords: *Air pollution, Data bases, Exposure, Concentration(Composition), Dosage, Public health, Chemical properties, Physical properties, Environmental health, *Toxic substances, Health risks.

EPA commissioned Systems Application, Inc. (SAI) to estimate, on a nationwide basis, public exposure to atmospheric concentrations of some forty chemicals. The purpose of the study was to provide EPA with information that would be helpful for determining which of the chemicals to study in more detail and in what order. The emphasis was on estimates that would support rough relative comparisons among the chemicals. There was no intent to define, by a scientifically defensible methodology, actual public exposure and actual ambient air concentrations; the purpose did not warrant the very heavy expenditure of funds that would be needed to carry our such a project. The study made free use of such techniques as algorithms for estimating emissions rather than actual emissions data, constructed plant locations rather than actual plant locations, simplified dispersion modeling to estimate ambient air concentrations, and a constructed 'population' file that relied on extrapolation of 1970 Bureau of Census data on where people lived.

PB84-102623/GAA PC **A08**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
World Food Aid Needs and Availabilities, 1983.
Jul 83, 173p
See also PB82-101486.

Keywords: *Food, *Food supply, Demand(Economics), Supply(Economics), Production, Developing countries, Cereal products, Agricultural products.

A major analysis supplementing international intelligence on global food aid needs. Despite current record levels for world cereal stocks and expected gains in world production of most major cereals next year, the need for food aid in 1983/84 will continue at moderate to severe levels in the majority of low-income countries.

PB84-102904/GAA PC **A02**/MF **A01**
Agricultural Research Service, Beltsville, MD.
Procedure for Isolation and Identification of Salmonella From Poultry Carcasses.
Agriculture handbook,
N. A. Cox, J. E. Thomson, and J. S. Bailey. Aug 83, 14p USDA/ARS/AH-603
Color illustrations reproduced in black and white.

Keywords: *Food contamination, *Poultry, Manuals, Isolation, Sampling, Identifying, Tests.

This manual describes a sensitive, rapid, and accurate procedure to sample poultry carcasses, then detect and identify salmonella contamination.

PB84-102912/GAA PC **A05**/MF **A01**
Office of Technology Assessment, Washington, DC.
Water-Related Technologies for Sustainable Agriculture in Arid/Semiarid Lands. Selected Foreign Experience.
Background paper.
May 83, 83p OTA-BP-F-20

Keywords: *Irrigation, *Water supply, *Arid land, Semiarid land, Agriculture, Land use, Plant genetics, Improvements, Droughts, Australia, Egypt, Pakistan, Israel, Technology assessment, *Guayule.

This report complements the forthcoming Office of Technology Assessment on water and agriculture in U.S. arid/semiarid lands. The full assessment focuses on U.S. experience. The global significance of agricultural research and development on arid/semiarid lands is underscored by the fact that as much as 20 percent of the Earth's surface is arid and semiarid, containing nearly 16 percent of the world's population. Described in the report are selected foreign experiences using technology to develop and sustain agriculture in arid lands.

PB84-103159/GAA PC **A05**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
Sex Roles in the Nigerian TIV Farm Household and the Differential Impacts of Development Projects.
Staff rept.,
M. E. Burfisher, and N. R. Horenstein. Oct 82, 77p AGES-820930

Keywords: *Farming, *Rural areas, Farms, Households, *Nigeria, *Project planning, Roles(Behavior), Methodology, Income.

This paper provides a planning methodology for development projects that incorporates sex role differences in the farm household. It focuses on the Tiv people of Central Nigeria. The paper provides a quantitative comparison between the projected impacts of a development project using a conventional planning methodology based on the aggregated farm household and the proposed methodology in which project impacts are disaggregated by sex. It finds that a consideration of sex role differences helps to identify obstacles and flexibilities that are not anticipated by conventional analysis but which can influence farmers' decisions to adopt new technologies.

PB84-103167/GAA PC **A04**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
White Pan Bread Marketing Spreads Methodology.
Staff rept.,
L. D. Schnake. Mar 83, 75p AGES-830224

Keywords: *Food, *Marketing, Prices, Market value, Oilseeds, Cost analysis, Wheat, Ingredients, Flour mills, Exports.

Explained is the methodology used in the USDA marketing spreads series for white pan bread which involves price spreads, farm value of ingredients, and cost of farm ingredients to flour millers and bakeries. Ingredients have changed in relation to changes in wet corn milling, oilseed processing, and bakery technology. Calculation of marketing spreads for white pan bread have been adjusted to account for these changes. Changes in marketing patterns that have resulted from expanding export markets for wheat are also taken into account in determining the cost of wheat to flour mills and in the value of farm ingredients used in making bread.

PB84-103183/GAA PC **A09**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
Beef and Livestock Supply: Simple Models.
Staff rept.,
D. W. Regier. Dec 82, 200p AGES-821126

Keywords: *Economic analysis, *Livestock, Projections.

Simple modeling systems of U.S. beef and cattle supply are presented. They are intended as guides for analysis and projection of livestock sectors in large multicommodity models of the world. Beef and cattle are the main commodities of the livestock balance shipped in world trade. Analysis is at the highest level of aggregation: a 4-equation version is the smallest, containing the herd balance, animals born and slaughtered, and meat obtained; a 7-equation version resembles the former, but identifies the rates of calving and slaughter and the average carcass weight as behavioral. Both approaches perform well. A dairy sector performs better in the smaller version.

PB84-103845/GAA PC **A02**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
New Methodological Approach for Estimating Agricultural Costs of Production.
Staff rept.,
G. Hoffman, and C. Gustafson. May 83, 24p AGES-830513

Keywords: *Agricultural economics, Production, Cost estimates, Losses, Capital, Land, Commodities, Cash flow.

Current concepts and procedures used by USDA to estimate farm enterprise costs of production are inadequate for describing economic conditions of various producer groups. The 1981 Agriculture and Food Act gives USDA greater flexibility in estimating production costs. New procedures for developing estimates that deal with problems of unrealized farmland capital grains, cash flow, and returns to the resources of production are described in this report.

PB84-104009/GAA PC **A20**/MF **A01**
National Center for Atmospheric Research, Boulder, CO.
Use of a Simulation Model in Assessing the Impacts of Climate on the World Food System.
Doctoral thesis,
D. M. Liverman. 1983, 461p NCAR/CT-77
Prepared in cooperation with California Univ., Los Angeles. Sponsored in part by National Science Foundation, Washington, DC.

Keywords: *Crops, *Meteorology, *Economic analysis, Food, Supply(Economics), Yield, Mathematical models, Trends, Statistical analysis, Comparison, Theses, Production, Prices, Imports, Computer programs, Fortran, Global.

Climate variation and long-term change can cause fluctuations in yields of major food crops. The interdependencies between global environment and economy are such that changes in yield are reflected in changes in food supply, trade and consumption. This dissertation assesses the value of a simulation model for studying the impacts of climate on the world food system. A protypical global model (the International Futures Simulation) is tested for the sensitivity of major food system variables to changes in crop yield. Crop yield is changed as a surrogate for climate, change and variation. The response of the model to sudden, step and trend changes in a crop yield factor is monitored and compared statistically to the results of a standard run. The overall food system model is shown to be sensitive to changes in crop yields, particularly to sudden and step changes in the U.S., South Asian, or all regions, as measured by world accumulated starvation over the 1975-2000 time period.

PB84-104041/GAA PC **A04**/MF **A01**
Office of Technology Assessment, Washington, DC.
Sustaining Tropical Forest Resources. Background Paper Number 1. Reforestation of Degraded Lands.
May 83, 65p OTA-BP-F-18

Keywords: *Tropical regions, *Soils, *Forestry, Soil properties, Plant reproduction, Arid land, Soil erosion, Semiarid land, Planting, Cultivation, Desertification.

This paper is part of The Office of Technology Assessment's (forthcoming) assessment Technologies to Sustain Tropical Forest Resources. It is designed to provide an overview of some reforestation technologies and their possible beneficial and adverse impacts.

PB84-104058/GAA PC **A04**/MF **A01**
Office of Technology Assessment, Washington, DC.
Sustaining Tropical Forest Resources. Background Paper Number 2. U.S. and International Institutions.
May 83, 73p OTA-BP-F-19

Keywords: *Tropical regions, *Forestry, *Natural resources, Organizations, Developing countries, Constraints, Reforestration, Institutions, Deforestation.

This background paper explores the roles of national, regional and international institutions and the private sector in developing and implementing technologies to sustain tropical forests. It is part of the OTA (forthcoming) report Technologies to Sustain Tropical Forest Resources. This paper explains how U.S. and international institutions affect the development and implementation of technologies to sustain tropical forest resources; reviews the capabilities of a range of selected U.S. institutions, developed and developing world institutions, funding foundations, and private sector organizations; and discusses the constraints and opportunities faced by these institutions.

PB84-104207/GAA PC **A02**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg. Sea Grant Project.
Seafood Processing Wastes as Fish Meal Substitutes in Pelleted Catfish Feeds,
J. C. Dean, L. A. Nielsen, and G. J. Flick. 1983, 22p
VPI-SG-82-05, NOAA-83100607
Grant NA81AA-D-00025

Keywords: *Waste recycling, *Animal feeds, *Aquaculture, *Seafood, Food processing, Industrial wastes, Proteins, Substitutes, Nutritive value, Chemical analysis, Fats, Ash content, Moisture content, Comparison, Fish protein concentrates, Cost effectiveness, Tables (Data).

Two significant problems face different sectors of the commercial fisheries industry. First, the scarcity of dependable, affordable supplies of high quality protein meals for fish feeds is a problem for fish-farmers. Second, the daily mass of wastes from seafood processing creates a disposal problem at seafood plants along the coast. This booklet describes a way in which these problems may be linked to the mutual benefit of aquaculturists and seafood processors.

PB84-104488/GAA PC **A12**/MF **A01**
Texas A and M Univ., College Station. Sea Grant Coll. Program.
Proceedings of the Annual Tropical and Subtropical Fisheries Conference of the Americas (8th),
R. Nickelson, II. Aug 83, 275p TAMU-SG-83-112, NOAA-83100604
Grant NA81AA-D-00092
See also PB82-235094.

Keywords: *Tropical regions, *Fisheries, Shrimps, Production, Imports, Lobsters, Crabs, Porifera, Mollusca, Parasites, Food processing, Bacteria, Seafood, Flavor, Disease vectors.

Contents:
- Activities of the Gulf of Mexico fishery management council;
- World shrimp production trends and the U.S. import market;
- World production, imports and U.S. demand for Spiny Lobsters;
- Ways of improving communication (Extension) between the fisheries industry and institutes in Latin America;
- Temporal changes in fish community diversity near a sewage outfall, Mokapu, O'ahu, Hawai'i;
- Preliminary results of a study of survival and growth of cut vs. hooked commercial sponges in the Florida Keys;
- Preliminary observations from on-board handling deep-sea crabs (Geryon) harvested from the Gulf of Mexico;
- Experimental gear for harvesting deep-sea crab (Geryon) from the Gulf of Mexico;
- Purse seine fishing for coastal pelagic species in the Northern Gulf of Mexico;
- Adductor muscle parasites, Sulcascaris sulcata, in calico scallops from the southest coast of the United States;
- Determination of the thermal death time of Vibrio cholerae in shrimp (Penaeus setiferus);
- Evaluation of the elevated temperature incubation procedure for the recovery of salmonellae from oysters;
- Incidence of salmonellae in clams, oysters, crabs and mullet harvested from two locations in Florida.

PB84-104561/GAA PC **A05**/MF **A01**
SG Associates, Inc., Boston, MA.
Simplified Aids for Transportation Analysis: Principles and Procedures for Subarea Planning.
Final rept.,
M. Golenberg, and J. A. Howard. May 83, 89p*
FHWA/PL-83/003
Contract DTFH61-80-0071
Prepared in cooperation with Multisystems, Inc., Cambridge, MA. Sponsored in part by Urban Mass Transportation Administration, Washington, DC. See also PB84-104579.

Keywords: *Transportation management, *Urban planning, Guidelines, Urban area, Central city, Urban transportation, Highway transportation, Mass transportation, Procedures, Transportation corridors, Case studies.

The Guide provides the planner with guidance in designing the planning analysis and selecting the techniques for carrying out specific types of subarea planning studies. The guide addresses the many variations of subarea planning problems including: (1) short and long range studies; (2) use of TSM operational and low cost as well as major capital improvement actions; and (3) planning at tthe corridor level, for activity centers such as CBD's and for localized sites and facilities. The study approach includes seven steps discussed in this report: Define the Problem; Define the Study Area; Organize the Technical Approach; Base or Existing Conditions Analysis; Future Conditions Analysis; Generating, Testing and Evaluating Alternatives; and Recommendations and Preparation of Implementation Program. Three case studies accompany this guide which illustrate applications of the Principles and Procedures to a short range TSM corridor planning study, a short range TSM subarea (CBD) planning study, and a major capital improvement planning study.

PB84-105089/GAA PC **A03**/MF **A01**
Mississippi State Highway Dept., Jackson. Research and Development Div.
Evaluation of Chem-Crete High Strength Modified Asphalt Concentrate.
Final rept.,
A. B. Crawley. Sep 83, 30p MSHD-RD-83-675
Sponsored in part by Federal Highway Administration, Washington, DC.

Keywords: *Pavements, Additives, Bituminous cements, Field tests, Performance evaluation, Mississippi, Chem-Crete.

A Chem-Crete modified sand asphalt base course was constructed and evaluated in order to determine its ability to significantly increase the Marshall Stability of the paving material. Test and control sections were established on a low traffic volume coastal highway. The base course mixture was produced in an asphalt batch plant with only minor changes in plant operations. No problems developed during mix production, laydown or compaction.

PB84-105238/GAA PC **A06**/MF **A01**
Office of Personnel Management, Washington, DC. Workforce Effectiveness and Development Group.
Assessing Changes in Job Behavior Due to Training: A Guide to the Participant Action Plan Approach.
Oct 79, 110p OPM/WDG-83/8

Keywords: *Employee participation, *Training, Behavior, Evaluation, Supervisors, Instructional materials.

The Participant Action Plan Approach (PAPA), a generic evaluation method developed by the U.S. Office of Personnel Management, enables evaluators to determine the extent of behavioral change which has occurred as a result of participants' attending a training course. At the end of training, participants fill out an action plan - listing the changes they want to implement when they return to their jobs. The evaluator follows up with the participants several months later, through interviews or questionnaires, to obtain specific examples of change, as well as other data such as factors interfering with attempted change and the impact on the organization of new efforts made by participants. Variations on the basic PAPA process include following up with participants without having them fill out action plans during the course (still collecting examples of behavioral change), and involving the supervisors of the participants in the action planning process, either before or after the course or both. The PAPA Guide contains complete step-by-step instructions for conducting an evaluation using PAPA, including forms, alternative ways to analyze results, and a sample report format.

PB84-105584/GAA PC **A03**/MF **A01**
Nebraska Univ.-Lincoln. Dept. of Agricultural Engineering.
Increased Water Conservation and Percolation through Improved Tillage Practices,
H. D. Wittmuss. 1980, 36p W83-04160, , OWRT-A-069-NEB(1)
Contract DI-14-34-0001-2129
Prepared in cooperation with Nebraska Water Resources Center, Lincoln.

Keywords: *Agriculture, *Water supply, Cultivation, *Water storage, Percolation, Soil water, Mathematical models, Irrigation, Ground water, Hydraulic conductivity, Water balance, Tables(Data), Nebraska.

A technique was developed to determine soil water storage and predict deep percolation under different tillage treatments and moisture levels. The dryland farmer can use the findings to vary his tillage practices to conserve the maximum amount of moisture for increased crop production. The irrigation farmer can use the findings to vary his tillage practices to increase deep percolation from rainfall to increase groundwater storage. A model was developed to predict deep percolation below the root zone based on the ratio of actual soil moisture content of the soil in the root zone to the saturated moisture of the soil (degree of saturation) and some parametric constants depending on soil type. The amount of water stored in the root zone increased gradually during the growing season. There were no significant differences in deep percolation or crop yields among overall tillage treatments.

PB84-105758/GAA PC **A03**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Managing Tropical Animal Resources: Butterfly Farming in Papua New Guinea.
Final rept.
Jun 83, 46p 44
Library of Congress catalog card no. 83-061857. Sponsored in part by Agency for International Development, Washington, DC.

Keywords: *Farming, Wildlife, Conservation, Rural areas, *Papua New Guinea, Tropical regions.

Butterfly farming is a growing new industry in Papua New Guinea, and by turning these insects into cash crops, villagers are both earning money and practicing sound wildlife conservation. In this unique program, butterfly farming is being used to complement the preservation of species and habitats. In balancing the utilization of common butterflies with the protection of the most threatened species, PNG is providing a model for other countries. The program demonstrates how village development can become an integral part of conservation.

PB84-105766/GAA PC **A04**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Opportunities for Control of Dracunculiasis: Report of a Workshop Held at Washington, DC. on June 16-19, 1982.
Final rept.
1983, 74p 49
Sponsored in part by Agency for International Development, Washington, DC.

Keywords: *Parasites, *Diseases, *Tropical regions, Public health, Developing countries, Tropical diseases, Guinea worm infection.

Dracunculiasis, or guinea worm disease, is a parasitic disease that has been the cause of human suffering and an impediment to economic development in parts of Africa, India, and the Middle East. Until recently the disease has not been the subject of sustained research or control efforts, because it does not kill but rather temporarily disables people in remote, rural areas. This is the report of the first international meeting on dracunculiasis. It contains the findings and recommendations of a distinguished group of scientists who were brought together to discuss dracunculiasis as an international health problem.

PB84-105774/GAA PC **A06**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Environmental Change in the West African Sahel.
Final rept.
Jul 83, 105p 50
Sponsored in part by Agency for International Development, Washington, DC.

Keywords: *Environmental surveys, *Agriculture, *West Africa, *Project planning, Ecology, Livestock, Production, Rainfall.

An inadequate understanding of Sahelian climatology, environmental history and ecosystem function has consistently hindered the formulation and successful implementation of environmental and agricultural projects in the Sahel. In this study the Advisory Committee of the Sahel of the National Research Council has attempted to clarify the environmental history of the region and provide needed baseline information for the formulation of projects to rehabilitate Sahelian ecosystems and promote sustainable agricultural and livestock production.

PB84-105808/GAA PC **A04**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Workshops on the Management of Urban Waste and on Wastewater Reuse in Agriculture Held at Tunis, Tunisia on April 7-28, 1983.
Staff summary rept. (Final).
Aug 83, 58p 83-5
Contract AID/NE-C-1536
Sponsored in part by Ministere de l'Enseignement Superieur et de la Recherche Scientifique, Tunis (Tunisia).

Keywords: *Waste water reuse, *Agriculture, *Tunisia, Sanitation, Sludge disposal, Irrigation, Metals, Solid waste disposal, Sewage treatment.

The Board on Science and Technology for International Development helped organize and participated in two workshops in Tunis on Management of Urban Waste and Wastewater Reuse in Agriculture in April 1983. The workshop on Management of Urban Waste concentrated on the following topics: Overview of urban refuse disposal methods; Underlying concepts of composting; Scientific principles of composting; Pilot-scale experimentation; Heavy metals and pathogens; and Economic considerations. The Workshop of Wastewater Reuse in Agriculture focused on the following topics: Quality requirements for the use of sewage effluent for irrigation; Principles of sewage treatment and practical sewage irrigation in the U.S.

PB84-106806/GAA PC **A04**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Technology for Increasing Rural Productivity in Indonesia - Report of a Workshop Held at Jakarta, Indonesia on October 7-15, 1982.
Final rept.
1983, 60p 83-4
Contract AID-497-79-100-23

Keywords: *Technology transfer, *Productivity, *Rural areas, *Indonesia, Population growth, Migration, *Economic development.

The most serious problem confronting Indonesia is its high rate of population growth. In particular this problem contributes heavily to the poverty of rural populations. In 1982, a second workshop was held to determine what research is required to enhance rural productivity. The workshop was attended by Indonesian and NRC participants with varied backgrounds to encourage a multidisciplinary approach toward finding solutions to the problems facing rural Indoesia. The report summarizes the discussions of the workshop and includes the recommendations of the U.S. and Indoesian particpants.

PB84-108307/GAA PC **E05**/MF **E05**
Agricultural Research Council, Oxford (England). Weed Research Organization.
Activity and Pre-Emergence Selectivity of Some Recently Developed Herbicides: Chlomethoxynil, NC 20484 and MBR 18337.
Technical rept.,
W. G. Richardson, T. M. West, and C. Parker. Mar 82, 54p ARC/WRO/TR-64, ISBN-0-7084-0239-9
Also pub. in ISSN-0511-4136.

Keywords: *Herbicides, *Weed control, Pesticides, Farm crops, Tables(Data), Soil analysis, Spraying, Ether/dichlorophenyl-methoxy-nitrophenyl, Ethane sulfonic acid/dihydra dimethyl-benzofuranyl, Methane sulfonamide/N-((ethylthio)-(trifluoromethyl)phenyl).

In glasshouse pot experiments 3 herbicides were examined for pre-emergence selectivity as soil surface sprays on 69 species of temperate and tropical crops and weeds. Persistence in the soil, examined for 33 weeks, was as long for chlomethoxynil as for simazine. Persistence of NC 20484 and MBR 18337 was longer than that of cyanazine but not as long as that of simazine.

PB84-108455/GAA PC **A09**/MF **A01**
National Research Council, Washington, DC. Committee on Population and Demography.
Levels and Recent Trends in Fertility and Mortality in Brazil.
Final rept.
1983, 198p 21
Sponsored in part by Agency for International Development, Washington, DC.

Keywords: *Brazil, Population growth, *Demography, *Fertility, Mortality, Children, Census.

During the past decade Brazil has undergone two important demographic changes: (1) fertility decline that had already begun by the time of the 1970 census has continued at what appears to be an ever increasing pace; (2) a household survey program has completed at least 6 nationwide surveys during the 1970-1979 decade all of which explored demographic characteristics of the population. Thus there is a great deal of data on the period since 1970, whereas there is little demographic information for years prior to 1970. Chapter 1 provides detailed descriptions of the sources of demographic data used in the report. Chapters 2 and 3 describe the analytical methods applied in deriving estimates of mortality and fertility. Chapter 4 deals with population growth.

PB84-108539/GAA PC **A05**/MF **A01**
Federal Coordinating Council for Science, Engineering and Technology, Washington, DC.
National Aquaculture Development Plan. Volume 1.
Final rept.,
Sep 83, 82p
See also Volume 2, PB84-108547.

Keywords: *Fisheries, *Aquaculture, Production, Genetics, Reproduction(Biology), Animal nutrition, Harvesting, Pest control, Marketing, Legislation, Economic conditions, Conflicts, Research projects, National Aquaculture Act of 1980.

This report (l) describes technologies, problems, and opportunities associated with aquaculture in the U.S. and its territories. It recommends actions to solve problems and analyzes the social, environmental, and economic impacts of growth in aquaculture.

PB84-108547/GAA PC **A10**/MF **A01**
Federal Coordinating Council for Science, Engineering and Technology, Washington, DC.
National Aquaculture Development Plan. Volume 2.
Final rept.
Sep 83, 206p
See also Volume 1, PB84-108539.

Keywords: *Aquaculture, *Fisheries, Growth, Economic impact, Fresh water fishes, Catfishes, Clams, Mussels, Oysters, Shrimps, Bass, Trout, Economic conditions, Production, Regulations, Genetics, Reproduction(Biology), Baitfish.

The report describes technologies, problems, and opportunities associated with aquaculture in the U.S. and its territories. This study contains in-depth discussions of important, selected aquaculture species, an extensive bibliography and a list of contributors.

PB84-109073/GAA PC **E04**/MF **E04**
Agricultural Research Council, Oxford (England). Weed Research Organization.
Activity and Pre-Emergence Selectivity of Some Recently Developed Herbicides: AC 213087 and AC 222293.
Technical rept.,
W. G. Richardson, T. M. West, and C. Parker. Dec 82, 42p ARC/WRO/TR-66, ISBN-0-7084-0258-5
Also pub. in ISSN-0511-4136.

Keywords: *Herbicides, *Weed control, *Crops, Grain crops, Tolerances(Physiology), Spraying, Wheat plants, Barley plants, Effectiveness, Lettuce, Greenhouses, Tests, AC 213087 herbicide, AC 222293 herbicide.

In glasshouse pot experiments 2 herbicides were examined for pre-emergence selectivity as soil surface sprays on 69 species of tropical crops and weeds. AC 213087 and AC 222293 were notable for control of Avena fatua and Alopecurus myosuroides and were relatively safe on wheat, barley and maize. Tolerance by those crops was increased by seed dressings of the safener 1,8-naphthalic anhydride. Considerable control of important weeds such as Veronica persica and Galium aparine was achieved but Compositae were generally resistant. Lettuce was tolerant to AC 222293.

PB84-109594/GAA PC **E05**/MF **E05**
Agricultural Research Council, Oxford (England). Weed Research Organization.
Activity and Post-Emergence Selectivity of Some Recently Developed Herbicides: Trifopsime, Glufosinate, RH 8817, MBR 18337 and NC 20484.
Technical rept.,
W. G. Richardson, T. M. West, and C. Parker. Dec 82, 66p ARC/WRO/TR-67, ISBN-0-7084-0259-3
Also pub. in ISSN-0511-4135.

Keywords: *Herbicides, *Weed control, *Farming, *Crops, Vegetable crops, Grasses, Tolerances(Physiology), Grain crops, Effectiveness, Damage, Spraying, Glufosinate, Trifopsime, RH 8817 herbicide, MBR 18337 herbicide, NC 20484 herbicide.

Post-emergence selectivity of 5 new herbicides was examined on 37 temperate and 28 tropical species of crops and weeds. Trifopsime, now withdrawn, was active pre- and post-emergence. Most annual and perennial grass weeds were controlled post-emergence and there was some effect on Poa annua, usually resistant to aryloxy-phenoxy herbicides. Volunteer cereals were susceptible but all broad-leaved weeds were resistant. Onion and broad-leaved crops were highly tolerant. Glufosinate was highly active as a foliar spray with little or no activity through the soil. It was mainly non-selective, damaging most crops as well as controlling most broad-leaved and grass weeds. RH 8817, pre- and post-emergence, controlled several annual broad-leaved weeds post-emergence but grasses were more resistant. MBR 18337 controlled only a few annual grass weeds in chickpea, rape, cabbage and radish post-emergence. NC 20484 controlled several annual grass and broad-leaved weeds post-emergence.

PB84-109628/GAA PC **E08**/MF **E01**
Swedish Council for Building Research, Stockholm.
Municipal Planning: Restrictions, Methods and Organizational Problems,
A. Khakee. 1983, 175p D14:1983

Keywords: *Urban planning, Methodology, *Economic development, Local government, Central city, Businesses, Coordination.

This study aims to analyze some of the problems of municipal planning with reference to planning that has been attempted in Sweden and in the context of new ideas evolved as a result of research in urban modelling, planning organization and futures studies.

PB84-110170/GAA PC **E05**/MF **E05**
Institute of Occupational Medicine, Edinburgh (Scotland).
Study of the Importance of 'Total' Dust (As Compared with the Respirable Fraction) in Causing Upper Respiratory Disease.
Final rept. Mar 77-Feb 80,
A. J. Cowie, N. P. Crawford, B. G. Miller, and J. Dodgson. Jun 81, 56p TM/81/9, EUR/P-54

Keywords: *Diseases, *Mining, Exposure, Pneumoconiosis, Toxicity, *Occupational safety and health.

The importance of the role of dust in the development of coalminers' pneumoconiosis is well established but its relationship with upper respiratory disease ('chronic bronchitis') is less well defined. Research carried out within the last 10 years has demonstrated relationships between the prevalence of chronic respiratory symptoms, reduction of lung function and exposure to the mass of the so-called respirable fraction of coalmine dust. It has been suggested, however, that a fraction of the airborne dust which contained more larger particles than the respirable fraction might be more appropriate for comparison with upper respiratory disease. The aim of the present study is to examine this question.

PB84-110923/GAA PC **E06**/MF **E06**
Institute of Occupational Medicine, Edinburgh (Scotland).
Toxicology of Calcium Silicate Insulating Materials,
J. M. G. Davis, J. Addison, R. E. Bolton, K. Donaldson, and A. D. Jones. Jan 83, 100p TM/83/1

Keywords: *Toxic substances, Respiration, Mineralogy, Morbidity, Mortality, Dust, *Occupational safety and health, Capocil 16, Newtherm 800, Paratemp AF.

For many years asbestos was used as the main insulation material in the engine rooms of ships. Its high resistance to heat and chemical corrosion made it an ideal material for use in these situation. However, with the realization that asbestos dust was extremely pathogenic when inhaled, producing pulmonary fibrosis or asbestosis, bronchial carcinomas and mesotheliomas, it was replaced by a variety of substitutes. In the British Royal Navy the main substitutes for the insulation of machinery have been calcium silicate composites. The main constituent of these products is tobermorite and they are manufactured from lime and either amorphous silica or quartz but with variable additives including man-made mineral fibre, cellulose fibre, amorphous silica and haematite. The purpose of the present project was to use the inhalation technique to examine the effects in rats of dust from three calcium silicate insulation materials currently used in H.M. ships.

PB84-111020/GAA PC **A03**/MF **A01**
Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.
Analysis of Multiresource Production for National Assessments and Appraisals.
Forest Service general technical rept. (Final),
L. A. Joyce, B. McKinnon, J. G. Hof, and T. W. Hoekstra. Aug 83, 27p FSGTR/RM-101

Keywords: *Management techniques, *Forestry, Economic factors, Production, Linear programming, Assessments, Ecosystems.

This report gives an overview of the analytical methods used in integrated (multidisciplinary, multiresource, and multilevel) land management production analyses. The ecological and economic theory underlying both simulations and optimization methods are also reviewed.

PB84-111566/GAA PC **A02**/MF **A01**
National Center for Health Services Research, Rockville, MD.
Hospital Cost and Utilization Project. Project Overview.
Research note 1,
M. C. Hornbrook. Jun 83, 25p* NCHSR-83-76, DHHS/PUB/PHS-83-3343
See also PB84-111574.

Keywords: *Health, *Project evaluation, Cost analysis, Research projects, Policies, Utilization, Patients, Information systems, Hospital Cost and Utilization Project, Health care.

Goals of this NCHSR study are to help understand how hospitals provide health care services and to determine patterns of hospital use and costs. HCUP is specifically designed to provide information and analyses on research and policy questions pertaining to the performance of the hospital industry. This introductory HCUP Research Note provides a complete project overview. The need for this research project is described and research objectives are defined. Construction of the data base is detailed, along with a description of its limitations. Abstracts of selected ongoing studies also are included.

PB84-111574/GAA PC **A02**/MF **A01**
National Center for Health Services Research, Rockville, MD.
Hospital Cost and Utilization Project. Characteristics of Financially Distressed Hospitals.
Research note 3,
J. V. Kelly, and J. J. O'Brien. Jun 83, 21p* NCHSR-83-77, DHHS/PUB/PHS-83-3352
See also PB84-111566.

Keywords: *Financial management, *Health, Cost analysis, Research projects, Utilization, Liabilities, Policies, Hospital Cost and Utilization Project, Health care.

Goals of this National Center for Health Services Research study are to help understand how hospitals provide health care services and to determine patterns of hospital use and costs. HCUP is specifically designed to provide information and analyses on research and policy questions pertaining to the performance of the hospital industry. This HCUP Research Note identifies and clarifies the roles of hospital case mix, operating characteristics, and other factors that may contribute to financial distress. The effects of chronic deficits on hospital management and operations are discussed. Chronic hospital financial distress is defined and analyzed across hospital locations. Differences in patient case mix and treatment patterns are examined to test hypotheses regarding causes of chronic deficits. Cost and revenue factors associated with differences in hospital output and operating characteristics also are contrasted. A discussion of policy implications concludes the report.

PB84-111830/GAA PC **A04**/MF **A01**
Cornell Univ., Ithaca, NY.
Nature of Phosphorus Fractions in Land Runoff and Their Availability to Algae.
Final rept.,
J. P. Barlow, D. R. Bouldin, R. T. Oglesby, W. R. Schaffner, and M. S. Glase. 1983, 66p W84-00043, , OWRT-B-098-NY(1)
Contract DI-14-34-0001-1251

Keywords: *Water pollution, *Algae, Bioassay, Chemical reactions, Sorption, Concentration(Composition), Phosphorus organic compounds, Fertilizers, Availability, New York.

Phosphorus in agricultural discharge and streams was examined for biological availability of soluble fractions and for the quantity of these in discharge. In streams, very little soluble P was detected, even during heavy flow. Although there was considerable variability in the concentration of P discharged from fields, the total amount lost was closely related to the amount of water discharged. Soluble P, both molybdate reactive and unreactive was largely biologically available as determined by algal bioassays and bioassays using natural pond microfloral assemblages. Soluble P which was less available after herbicide treatment or frosts may have resulted from breakdown of plant material. Sorption was related to the quantity of suspended particulates.

PB84-111988/GAA PC **E08**/MF **E08**
National Dairy Research Inst., Karnal (India).
Operational Research Project: Integrated Milk and Crop Production Project for Increased Productivity, Employment and Farm Income in Village Around Karnal.
Progress Rept. 1975-81,
R. K. Patel, C. B. Singh, M. Pal, P. A. Sarma, and S. C. Dass. 1982, 169p

Keywords: *Crops, *Management techniques, *Productivity, Production, Improvement, Grain crops, Hay, Fertilizers, Animal husbandry, Reproduction(Biology), Agricultural economics, Education, India, Developing country application.

The rationale behind the project is that maximization of income from small farms is best ensured by a combination of dairy enterprise and crop cultivation. The two major planks of the program are the improvement in crop productivity and cattle development. The ultimate objective of the crop improvement program is to saturate the entire area with the new crop varieties of grain and fodder crops, and to introduce a new package of cultural practices. In the sphere of dairy development, the project has set up a network of artificial insemination and dairy cattle health improvement centers.

PB84-111996/GAA PC **E08**/MF **E08**
Ministry of Labour, Tokyo (Japan). Investigative Research Committee on the Effects of Microelectronics on Employment.
Effects of Microelectronics on Employment.
Interim rept.
Oct 83, 138p
Trans. of mono. Maikuroerekutoronikusu no Koyo ni Oyobosu Eikyo ni Tsuite (Chukan Hokoku), 106p Aug 82. See also PB83-245423.

Keywords: *Employment, *Electronics, *Machine tools, Robots, Automation, Technology innovation, Foreign countries, Industries.

The report provides results obtained in an ongoing investigation of the effects on employment of the introduction of microelectronics-based devices into the workplace. Such devices include numerical control machine tools, machining centers, industrial robots, flexible manufacturing systems, CAD/CAM, point-of-sale information control systems, office automation systems, and others. Topics include: progress of technological innovation based on microelectronics; theoretical views of the effects of microelectronics on employment; the present effects of microelectronics on employment in Japan; effects of industrial robots on employment; effects on employment in the automobile industry; effects on employment in the watch manufacturing industry; effects of office automation on employment; and anticipated future problems.

PB84-112002/GAA PC**$11.50**/MF**$11.50**
Agricultural Research Service, Washington, DC.
Tropical Yams and Their Potential. Part 1. 'Dioscorea esculenta'. Part 2. 'Dioscorea bulbifera'. Part 3. 'Dioscorea alata'. Part 4. 'Dioscorea rotundata and 'Dioscorea cayenensis'. Part 5. 'Dioscorea trifida'. Part 6. Minor Cultivated 'Dioscorea' Species.
Agricultural handbooks.
Nov 78, 188p
Sponsored in part by Agency for International Development, Washington, DC.

Keywords: *Tropical regions, *Potatoes, Botany, History, Distribution(Property), Classifications, Morphology, Cultivation, Planting, Fertilizing, Pest control, Plant diseases, Harvesting, Food storage, Marketing, Cookery, Food composition, Utilization, Yams.

The report describes several varieties of Dioscorea (Yams) which can be grown and used as a food source in tropical regions. Some of the subject areas covered are: Botany, varieties, culture, storage, food composition, and potential uses.

PB84-112010/GAA PC**$11.50**/MF**$11.50**
Agricultural Research Service, Washington, DC.

Vegetables for the Hot, Humid Tropics. Part 1. The Winged Bean, 'Psophocarpus tetragonolobus'. Part 2. Okra, 'Abelmoschus esculentus'. Part 3. Chaya, 'Cnidoscolus chayamansa'. Part 4. Sponge and Bottle Gourds, 'Luffa' and 'Lagenaria'. Part 5. Eggplant, 'Solanum melongena'. Part 6. Amaranth and Celosia, 'Amaranthus' and 'Celosia'. Part 7. The Peppers, 'Capsicum' Species. Part 8. Vegetable Corns, 'Zea mays'.
Jun 81, 180p

Keywords: *Tropical regions, *Vegetables, *Crops, Bean plants, Taxonomy, Cultivation, Planting, Soil properties, Yield, Nutritive value, Corn plants, Plant genetics, Plant reproduction, Insects, Plant diseases, Leaves(Botany), Roots.

The purpose of this series of bulletins is to furnish information about vegetables that can be grown in the hot, humid Tropics. The vegetables covered are either not well known, at least with respect to some uses, or not well distributed, but are productive during tropical rainy seasons. The techniques recommended can be applied on a small scale or with a low level of technology. Seed sources are suggested when necessary.

PB84-112515/GAA **PC$11.50/MF$11.50**
Agricultural Research Service, Washington, DC.
Cultivation of Neglected Tropical Fruits with Promise. Part 1. The Mangosteen. Part 2. The Mamey Sapote. Part 3. The Pummelo. Part 4. The Lanson. Part 5. The Canistel and Its Relatives. Part 6. The Rambutan. Part 7. The Durian. Part 8. The Pejibaye.
Jun 80, 136p

Keywords: *Crops, *Tropical regions, *Fruits, Cultivation, Plant reproduction, Planting, Soil properties, Plant diseases, Insects, Harvesting, Utilization, Pruning.

The collection of handbooks describes cultivation methods for several tropical fruit trees which are not widely known. The report describes care of the fruit trees, insects and diseases which are common, and harvesting methods.

PB84-112523/GAA **PC$7.50/MF$7.50**
Agricultural Research Service, Washington, DC.
Growing Food in Containers in the Tropics; Techniques and Plants for the Tropical Subsistence Farm.
Agricultural reviews and manuals,
F. W. Martin, and R. M. Ruperte. Jan 81, 81p
Also pub. in ISSN-0193-3779.

Keywords: *Tropical regions, *Crops, Containers, Plant growth, Soil properties, Drainage, Vegetable crops, Insect control. Nutritive value, Planting, Leguminous plants, Grain crops, Poultry, Livestock, Soil fertility, Hand tools, Forage crops, Trees(Plants), Small farms.

This publication is designed to help those who live in the Tropics and whose space is limited to grow some of their own food in containers. It contains information on choosing containers and sites, preparing the soil, establishing and caring for the plants, avoiding insect and disease problems, harvesting, and the suitability of potential crops for container culture in the Tropics. This publication is designed to help teach the subsistence farmer how to best meet his family's nutritional needs. Individual species of leaves, legumes, roots and tubers, fruit vegetables, and cereals that are especially appropriate for the Tropics are recommended. The use of trees on the subsistence farm is discussed and various trees are recommended either for their edible products or for other special products.

PB84-112531/GAA **PC$11.50/MF$11.50**
Agricultural Research Service, Washington, DC.
Edible Leaves of the Tropics (2nd Edition),
F. W. Martin, and R. M. Ruberte. 1979, 232p
See also Spanish version, PB84-112549. Prepared in cooperation with Mayaguez Inst. of Tropical Agriculture, PR.

Keywords: *Tropical regions, *Plants(Botany), *Crops, *Fruits, *Vegetables, Weeds, Seasonings, Tea, Lettuce, Cultivation, Plant reproduction, Soil properties, Poisonous plants, Acceptability, Taste, Listings, Herbs.

Contents:
The principal edible green leaf herbs of the tropics;
Some fruits, vegetables, and ornamental plants that also bear edible leaves;
Common weeds with edible green leaves;
Tropical trees with edible green leaves;
Tropical leaves as spices and teas;
Temperate zone green leaves in the tropics;
Lettuce in the tropics;
Tropical leaves that are poisonous;
Culture and care of green-leaved vegetables.

PB84-112549/GAA **PC$11.50/MF$11.50**
Agricultural Research Service, Washington, DC.
Hojas Comestibles del Tropico (Edible Leaves of the Tropics),
R. M. Ruberte, and F. W. Martin. 1975, 247p
Text in Spanish. See also English version, PB84-112531. Prepared in cooperation with Mayaguez Inst. of Tropical Agriculture, PR.

Keywords: *Tropical regions, *Plants(Botany), *Fruits, *Crops, *Vegetables, Weeds, Seasonings, Tea, Lettuce, Cultivation, Plant reproduction, Soil properties, Poisonous plants, Acceptability, Taste, Listings.

Contents:
The principal edible green leaf herbs of the tropics;
Some fruits, vegetables, and ornamental plants that also bear edible leaves;
Common weeds with edible green leaves;
Tropical trees with edible green leaves;
Tropical leaves as spices and teas;
Temperate zone green leaves in the tropics;
Lettuce in the tropics;
Tropical leaves that are poisonous;
Culture and care of green-leaved vegetables.

PB84-112713/GAA PC **E04**/MF **E04**
Royal Society, London (England).
Constraints on Research and Development in Some Smaller Manufacturing Companies: A Case Study of the Agricultural Engineering Industry.
Sep 82, 29p

Keywords: *Research and development, *Industrial plants, Manufacturing, Great Britain, Productivity, Technology innovation, Agricultural engineering.

The Committee decided to look at the constraints to R&D uptake in smaller companies in more traditional industries. It did so through a case study of the agricultural engineering industry. This particular industry was chosen for a number of reasons. Its decline in terms of import penetration and export performance is pronounced and well documented; it is composed of a large number of small companies yet its total size made a reasonably comprehensive study possible within the resources available to the Society; it is a traditionally-based industry which is, of necessity, adopting new technlogies. The study was concerned primarily with the extent to which the agricultural engineering industry was benefitting from R&D and the constraints on it so doing. The report contains a brief list of references.

PB84-112945/GAA PC **E03**/MF **E03**
National Dairy Research Inst., Karnal (India).
Calf Raising,
S. P. Arora. 1982, 25p
See also PB83-150938.

Keywords: *Livestock, *Animal husbandry, *India, Growth, Animal nutrition, Animal diseases, Mortality, Developing country application, Calves, Buffalo.

The success of cattle breeding projects depends upon the fast rearing of calves to a breedable age, with minimum mortality. All species exhibit optimum growth rate as per their hereditary characters with proper nutrition and management.

PB84-113125/GAA PC **E12**/MF **E12**
Indian Pump Manufacturers Association, Bombay.
Proceedings of the International Technical Seminar on Role of Pumps in the Changing Scene of Developing Countries (3rd) Held at New Delhi (India) on January 20-21, 1983.
Jan 83, 289p

Keywords: *Sewage treatment, *Water pumps, *Water supply, Centrifugal pumps, Submersible pumps, Sewage pumps, Feed pumps, Cavitation corrosion, Developing countries, Computer aided design.

The theme of this seminar was oriented to the role of pumps in different sectors of the economy such as water supply, sewage, and power generation. A total number of 12 papers were presented and discussed. These papers cover different types and applications of pumps such as boiler feed, screw, computer aided designing, and cavitation erosion.

PB84-113604/GAA PC **A04**/MF **A01**
New Mexico Water Resources Research Inst., Las Cruces.
Optimization of Primary Production by the Halophytic Algae, 'Dunaliella salina', in Saline Water.
Technical rept.,
R. Roubicek, and L. White-Hosford. Apr 83, 56p TR-166, W84-00138, , OWRT-A-067-NMEX(1)
Contract DI-14-34-0001-2133
Prepared in cooperation with New Mexico State Univ., Las Cruces. Biochemical Research Inst.

Keywords: *Algae, *Aquaculture, Biomass, Feasibility, Production, Salt water, Brackish water, Ponds, Photosynthesis, Metabolism, Solar radiation, Economic factors, Respiration, Energy conversion.

The industrial cultivation of algal biomass is a very attractive project for both primary and secondary metabolite production. The use of shallow ponds for algal biomass production in these areas enhances the evaporation rate of the water making salinity a limiting factor. For these reasons, the behavior of halophytic algae of the genus Dunaliella and the feasibility of employing submerged cultivation in a photo-bioreactor using brackish and saline media was investigated in the report.

PB84-113695/GAA PC **A03**/MF **A01**
Kansas Water Resources Research Inst., Manhattan.
Soil Crusting Affects Water Conservation and Infiltration.
Final technical rept. 1 Feb 82-31 Mar 83,
D. M. Powell, and J. M. Steichen. Mar 83, 33p CONTRIB-232, W84-00167, , OWRT-A-108-KAN(1)
Contract DI-14-34-0001-2118

Keywords: *Soils, *Farming, Farms, Water conservation, Mathematical models, Hydraulic conductivity, Soil texture, Field tests.

An infiltration model is developed to include formation of a soil crust under transient conditions. A Soil-Crust Index has been defined and experimentally tested for two Kansas soils. The infiltration model utilizing the Soil-Crust Index was field tested on several tillage practices but for only one soil. The results of the laboratory experiments failed to indicate that the Soil-Crust Index can be applied across soil textures. Additional information is needed, particularly as pertains to high Soil-Crust Index values, before this can be adequately determined.

PB84-114040/GAA PC **A05**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
Impact of Agricultural Growth Patterns on Import Demand for Food and Agricultural Commodities.
Staff rept.,
B. Mukhoti. Oct 83, 85p AGES-830907

Keywords: *Food products, *Food, *Agricultural economics, Economic analysis, Demand(Economics), Nigeria, Zimbabwe.

Analysis of key macroeconomic variables of the economies of Nigeria and Zimbabwe suggest that their respective agricultural growth patterns had some impact on their import demand for food and agricultural commodities during the decade of the 1970's. Nigeria's production structure of agriculture dominated by smallholder farming and a relatively even distribution of rural purchasing power, which are characteristic of the Uniformly Small Farm (USF) growth pattern, enhanced aggregate effective domestic demand via linkages and encouraged domestic consumption oriented production. Conversely, Zimbabwe's Dual Size Structure (DSS) pattern of agricultural growth gave rise to a depressed domestic demand structure with weak links to the larger economy, and fostered commercial, export oriented production. The former resulted in strong import demand, the latter in food exports.

PB84-114594/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Manufacture of Low-Cost Vehicles in Developing Countries. Development and Transfer of Technology Series No. 3.
1978, 39p UNIDO-ID/193

Keywords: *Motor vehicles, *Industrial plants, Economic impact, India, Philippines, Korea, Thailand, Bangladesh, Papua New Guinea, Government policies, Demand(Economics).

The document covers (1) The motor vehicles situation in India, the Philippines, Korea R, Thailand, Bangladesh and Papua New Guinea (2)economic aspects of manufacture; development potential (3) demand pattern (4) policy issues, government policy's, giving summary of related discussions at 1976 Melbourne meeting.

PB84-114602/GAA PC **E08**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Appropriate Industrial Technology for Paper Products and Small Pulp Mills.
Monographs no. 3.
1979, 160p UNIDO-ID/232/3

Keywords: *Paper industry, *Pulp, *Paper, Pulping, Technology, Paper products, Developing country application.

Contents:
Issues and considerations--(Note by the secretariat of UNIDO and report of the working group);
Selected background papers--(The pulp and paper industry in Brazil, evolution of the pulp and paper industry in the Philippines, appropriate industrial technology:
application in the pulp and paper industry in the Philippines;
the pulp and paper industry in Egypt, the experience of a developing country of Africa, strategies for developing pulp and paper industries in developing countries;
further development of mini paper technology in India, the search for an appropriate technology for the paper and board industry of the United Kingdom, pulping technology and requirements and potentialities of developing countries, appropriate technology for a low-cost paper project to stimulate the rural economy, prospects for establishing viable small-scale pulp and paper industries in developing countries, paper, paper products and pulp mills, small pulp and paper mills in developing countries and their recovery systems, universal pulping, a prospective fibrous resource for pulp and paper in Indonesia - alang-alang (Imperata cylindrica), and lime burning and alkaline pulping).

PB84-114610/GAA PC **E09**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Appropriate Industrial Technology for Energy for Rural Requirements.
Monographs no. 5.
1979, 180p UNIDO-ID/232/5

Keywords: *Energy, *Rural areas, *Energy source development, Developing countries, Planning, Appropriate technology, Energy sources, Energy resources, Energy supplies.

Contents:
Appropriate technology for rural energy supply in developing countries;
Energy sources for rural requirements;
Planning of rural energy systems:
Issues and perspectives;
Planning and development of animal energy resources in India;
Appropriate technology for rural energy supply in Indonesia;
Energy for rural requirements in Pakistan.

PB84-114628/GAA PC **E05**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Appropriate Industrial Technology for Textiles.
Monographs no. 6.
1979, 97p UNIDO-ID/232/6

Keywords: *Textile industry, Technology, Cotton spun yarns, Developing country application.

Contents;
Issues and considerations--(Note by the secretariat of UNIDO and report of the Working Group);
Selected background papers--(production of cotton with special reference to African conditions, basic problems of textile industries, evaluation of appropriate technology for textile production, appropriate technology for cotton yarn spinning in rural areas, dualism and technological harmony for balanced development of the textile industry, appropriate technology in the textile industry of Sri Lanka, and problems of the textile industry in Ghana).

PB84-114636/GAA PC **E05**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Appropriate Industrial Technology for Sugar.
Monographs no. 8.
1980, 99p UNIDO-ID/232/8

Keywords: *Sugar, *Industrial plants, *Food processing, Technology, Manufacturing, Sugarcane, Byproducts, Sweetening agents, Developing country application.

Contents:
Issues and considerations--(Note by the secretariat of UNIDO and report of the Working Group);
Selected background papers--(Appropriate technology in cane-sugar production, technological choices in sugar processing, cane-sugar production techniques in developing countries, mini sugar technology in India, appropriate technology for production of sugar and other sweetening agents, technology planning factors in the cane-sugar industry, and by-products of the sugar industry in Cuba).

PB84-114644/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Appropriate Industrial Technology for Oils and Fats.
Monographs no. 9.
1979, 61p UNIDO-ID/232/9

Keywords: *Vegetable oils, *Food processing, Technology, Substitutes, Developing country application.

Contents:
Issues and considerations--(Note by the secretariat of UNIDO and recommendations of the working group);
Selected background papers--(Appropriate industrial technology in oils and fats industries:
The case of Egypt, problems of raw materials acquisition in Ghana, appropriate technology for the production and processing of oils and fats industry in India, and appropriate technology for oils and fats in Yugoslavia).

PB84-114651/GAA PC **E08**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Appropriate Industrial Technology for Light Industries and Rural Workshops.
Monographs no. 11.
1980, 165p UNIDO-ID/232/11

Keywords: *Industrial development, *Rural areas, *Technology transfer, Meetings, *Small businesses, Developing country application.

This report on appropriate technology for light industries and rural areas, covers the issues and considerations relating to: Establishment of rural workshops or industrial centers for promotion of decentralization and rural industry; choice of technology; and program of action.

PB84-114677/GAA PC **A18**/MF **A01**
Chi Associates, Inc., Arlington, VA.
Proceedings from the Symposium on Design and Construction of Slurry Walls as Part of Permanent Structures Held at Cambridge, Massachusetts on August 30-31, 1979.
Final rept.,
B. Dennis. Mar 80, 418p FHWA-TS-80-221
Contract DOT-FH-11-9505

Keywords: *Construction, Tunnels, Subsurface structures, Slurries, Foundations, Construction management.

This volume contains the papers of the 20 speakers who addressed the topic of Slurry Walls at the Symposium sponsored by the Federal Highway Administration. The symposium was held at the Hyatt Regency Hotel in Cambridge, Massachusetts on August 30 & 31, 1979. The papers provide a thorough coverage of the design, construction, economics, geotechnical, instrumentation, economic, and legal aspects of the technique as well as pertinent examples of its application at sites around the world.

PB84-114743/GAA PC **A12**/MF **A01**
Office of Technology Assessment, Washington, DC.
Plants: The Potentials for Extracting Protein, Medicines, and Other Useful Chemicals - Workshop Proceedings.
Sep 83, 258p OTA-BP-F-23
Library of Congress catalog card no. 83-600588.

Keywords: *Plants(Botany), *Aquatic plants, *Chemical industry, *Medicinal plants, United States, Developing countries, Proteins, Drugs, Pesticides, Substitutes, Aquatic plants, Insect control, Consumer products.

This report describes some opportunities and constraints of commercially developing plant extracts, examples of some work being done in this field, and workshop participants' conclusions and recommendations concerning the Government's role in the area. Developing new crops or plant products offers a wide range of potential benefits to the United States and developing countries. Crop diversification and new product development in the United STates may substitute domestically produced goods for petroleum and other imports (including strategic and essential industrial materials); provide useful new consumer products; increase productive use of land resources, especially in marginal farming areas; generate employment in areas of underemployment or unemployment; and provide plant-derived biocides that cause little long-term ecological damage as alternatives to certain synthetic pesticides. In developing countries, new crops or new plant-derived products may help stimulate cottage industries, increase local and national self-sufficiency, and perhaps provide new export industries. This proceeding addresses these opportunities as well as constraints to and possible impacts of their development.

PB84-114842/GAA PC **A08**/MF **A01**
Office of Technology Assessment, Washington, DC.
Safety, Efficacy, and Cost Effectiveness of Therapeutic Apheresis - Health Technology Case Study 23: Medical Technology and Costs of the Medicare Program.
Jul 83, 171p OTA-HCS-23
Library of Congress catalog card no. 83-600554.

Keywords: *Health, *Safety, Efficacy, Cost effectiveness, Separation, Etiology, Therapy, Policies, Erythrocytes, Leucocytes, Platelets, Blood plasma, Reimbursement.

Apheresis is a procedure in which blood is separated into its basic components (red cells, white cells, platelets, and plasma), and one or more of these is selectively removed from the blood. It is applied therapeutically for the purpose of curing, alleviating, or treating a disease or its symptoms. The procedure can take several forms, though it is usually accomplished by removing venous whole blood from the body, separating the blood into cellular and noncellular (plasma) parts or 'fractions', and returning the cellular fraction to the patient. This case study (1) provides definitions and descriptions of the various types of apheresis technology, along with perspectives on the history and etiology of apheresis use, (2) describes the current treatment process and future trends, (3) reviews research on the scientific and medical aspects of therapeutic apheresis, (4) focuses on reimbursement and cost-effectiveness issues, and (5) discusses policy implications.

PB84-115047/GAA PC **E08**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Appropriate Industrial Technology for Drugs and Pharmaceuticals.
Monographs no. 10.
1980, 157p UNIDO-ID/232/10

Keywords: *Drugs, *Industrial plants, Technology, Developing country application.

Contents:
- Issues and considerations--(Note by the secretariat of UNIDO and report of the working group);
- Selected background papers--(Choice and adaptation of appropriate technology for the production of pharmaceuticals in developing countries, provision of drugs by appropriate technology, appropriate technology in drug and pharmaceutical industries of India, medicine for the rural population in India, the pharmaceutical industry of the Republic of Korea, choice and adaptation of appropriate technology in promoting health care in Zambia, adequate technology in the pharmaceutical industry:
- some thoughts on the Argentine case, and aspects of developing the pharmaceutical industry in Brazil).

PB84-115054/GAA PC **E08**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Appropriate Industrial Technology for Agricultural Machinery and Implements.
Monographs no. 4.
1979, 170p UNIDO-ID/232/4

Keywords: *Machine tools, *Hand tools, *Agricultural machinery, Production, Tractors, Government policies, Demand(Economics), Developing country application.

The report contains: Introductory note covering:/ Choice of technology/for/agricultural mechanization/ and production of/agricultural equipment/; Typical levels of production of/machinery/; Government policy and Background papers which relate to agriculture machinery.

PB84-115476/GAA PC **E04**/MF **E01**
Sydney Univ. (Australia). School of Civil and Mining Engineering.
Analysis of Deformations Caused by Loading Applied to the Walls of a Circular Tunnel.
Research rept.,
J. R. Booker, and J. P. Carter. Feb 83, 26p R-435

Keywords: *Tunneling, Loads(Forces), Cylindrical shells, Fourier transformations, Fourier series, Deformation.

An analytical solution to the problem of a load applied to a portion of the wall of a circular tunnel installed deep in a homogeneous isotropic material has been found. The solution is obtained by taking a Fourier transform, in the axial direction, of the field quantities and then representing these as a Fourier series in the polar angle. The solution has been used to analyze the problem of uniform normal loading applied over rectangular patches of the tunnel wall. An indication of how the solution can be applied to the tunnel jacking problem is given.

PB84-115682/GAA PC **A03**/MF **A01**
National Marine Fisheries Service, Panama City, FL. Panama City Lab.
Delphi Technique: A Potential Methodology for Evaluating Recreational Fisheries.
Technical memo.,
J. R. Zuboy. Apr 80, 29p NOAA-TM-NMFS-SEFC-19, NOAA-83110308

Keywords: *Fisheries, Forecasting, Estimating, Questionnaires, Decision making, Problem solving, Sport fishing, Catch statistics.

The Delphi technique, a methodology for systematically developing expert opinion consensus, is suggested as an approach for generating recreational fishery data. This paper describes the Delphi tehcnique, cites an example of how it has been applied in water resource management, and discusses the results of a Delphi experiment which was designed to provide an estimate of the recreational (diver) catch of spiny lobsters from Florida waters.

PB84-116151/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Appropriate Industrial Technology for Low-Cost Transport for Rural Areas. Monographs on Appropriate Industrial Technology No. 2.
1979, 62p UNIDO-ID/232/2

Keywords: *Rural areas, *Transportation, Economic factors, India, Philippines, Objectives, Developing country application, Appropriate industrial technology.

The report covers issues involved, problems, objectives; choice of technology for rural transport. It also presents relevant papers dealing with developing countries generally and with experience in India and the Philippines.

PB84-116607/GAA PC **A02**/MF **A01**
Bureau of Mines, Rolla, MO. Rolla Research Center.
Generation, Collection, and Analysis of Welding Fumes.
Rept. of investigations/1983,
J. F. McIlwain, and L. A. Neumeier. Sep 83, 21p BUMINES-RI-8793
Library of Congress catalog card no. 83-10128.

Keywords: *Instruments, *Air pollution, Hazardous materials, Chemical analysis, Chromium, Design criteria, Performance evaluation, Sampling, *Occupational safety and health.

The Bureau of Mines investigated fumes generated by selected welding materials used in mines in order to help determine their relative hazard potential. The initial phases of the study have been completed. A welding-fume generation and collection apparatus was designed, assembled, and calibrated. Five brands of coated, AWS-type E308-16 stainless steel electrodes were tested. Total fume generation rates of 0.39 to 0.51 g/min were measured. Quantitative chemical analyses were conducted for all of the principal fume constituents. Two analytical schemes were used to determine levels of the Cr(+6) and Cr(+3) species contained in the welding fumes; comparable results were obtained. The Cr(+6) was found to be the most hazardous constituent, leading to a maximum allowable total fume exposure of 1 mg/cu m. Fume generation rates and fume constituent analyses will be derived for other groups of welding electrodes using similar procedures.

PB84-116912/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Manual on Instrumentation and Quality Control in the Textile Industry.
Development and transfer of technology series no. 4. 1978, 55p

Keywords: *Textile industry, *Instruments, Tests, Tensile properties, Fibers, Yarns, Carpets, Laboratories, Developing country application.

Contents:
- General aspects of testing;
- Textile testing;
- Tensile properties of textiles;
- Fibres;
- Yarns;
- Filament yarns;
- Fabrics;
- Carpets;
- Chemical laboratories;
- Pilot plant;
- Annexes.

PB84-116920/GAA PC **E11**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Appropriate Industrial Technology for Construction and Building Materials.
Monograph no. 12.
1980, 229p UNIDO-ID/232/12

Keywords: *Construction, *Building materials, *Housing, *Technology assessment, Housing planning, Rural areas, Cements, Binders(Materials), Houses, Construction management, Developing country application.

UNIDO publication on appropriate technology for construction and building materials industry. It covers definition of problem and objectives; choice of technology for low-cost housing; appropriate construction techniques; research and development; required government policy, program of action; gives report of relevant meetings and 15 background papers.

PB84-116946/GAA PC **E07**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Appropriate Industrial Technology for Food Storage and Processing.
Monograph no. 7.
Jun 81, 135p UNIDO-ID/232/7
Errata sheet inserted.

Keywords: *Food processing, *Food storage, *India, Burma, Nigeria, Thailand, Employment, Policies, Developing country application, Appropriate technology.

As part of its effort to foster the rapid industrialization of developing countries, the United Nations Industrial Development Organization (UNIDO), since its inception in 1967, has been concerned with the general problem of developing and transferring industrial technology. The Second General Conference of UNIDO, held at Lima, Peru, in March 1975, gave UNIDO the specific mandate to deal in depth with the subject of appropriate industrial technology. Accordingly, UNIDO has initiated a concerted effort to develop a set of measures to promote the choice and application of appropriate technology in developing countries.

PB84-116953/GAA PC **E05**/MF **E05**
Electrical Research and Development Association, Makarpura (India).
Workshop on Technological Needs of Small and Medium Scale Manufacturers' of Electrical and Allied Products Held at Bombay on 22nd December 1981.
Technical rept,
Dec 81, 76p
Prepared in cooperation with Institution of Engineers (India), and Small Industries Service Inst., Bombay (India).

Keywords: *Electric power, *Industrial plants, Quality control, Consultants, Standardization, India.

This volume contains 15 technical papers presented in the workshop. The topics dealt are: Technological R&D and Testing Needs of Small Scale Manufacturers of Electric Motors, AC MFD Capacitors and Switches; the Present Condition of Testing and Certifying the products; Quality and Reliability Problems in Procurement of Materials; Railway & Small Scale Industries; Role of Consulting Engineering Organizations; Product Standardization and Development; and Role of Small Industries Service Institute.

PB84-117183/GAA PC **E07**/MF **E07**
National Board for Science and Technology, Dublin (Ireland).
Ireland - Science and Technology,
W. K. Downey, and R. Brew. c1983, 111p

Keywords: *Research and development, *Technology assessment, Organizations, Universities, Societies, *Education, Consulting services, Developing countries.

In this publication, the Board aims to provide a convenient guide to the organizations and institutions within the public sector which are concerned particularly with research and development and with scientific and technical education and consultancy. This publication is directed primarily towards public officials, business and professional people who wish to have further information regarding the scientific and technical infrastructure. The expertise and experience residing in many of the institutions and agencies will be particularly relevant to developing countries. Ireland, because of its size and comparatively recent development, may possess much of value to those countries now developing their own scientific and technical infrastructure. (Copyright (c) National Board for Science and Technology.)

PB84-117233/GAA PC **E06**/MF **E01**
Royal Tropical Inst., Amsterdam (Netherlands). Dept. of Agricultural Research.
Agricultural Research Annual Report for 1980-1981.
1982, 124p
See also PB83-265264.

Keywords: *Agriculture, *Research and development, Farms, Production, Soil conservation, Agricultural engineering, Developing countries.

The Koninklijk Instituut voor de Tropen (KIT), Royal Tropical Institute, in Amsterdam, The Netherlands, cooperates with governments, international organizations and private institutions throughout the world to help improving the standard of living in developing countries. The Institute deals primarily with scientific research, education and training, development cooperation and information in the fields of agriculture, health and social sciences. The Department of Agricultural Research, dealing with the agricultural development acitivities of the Institute, contributes in particular to the following programs: agricultural production improvements and increase in income of the agricultural smallholder; conservation and fertility of soils; propagation and protection of crops; small-scale technology; nutrition improvement.

PB84-118173/GAA PC **A07**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Chemistry and World Food Supplies: Research Priorities for Development - Report of a Workshop Held at Los Banos, Philippines, on December 11-14, 1982.
Final rept.
Sep 83, 126p R-83-6
Grant AID-DAN-5538-G-SS-1023-00

Keywords: *Research and development, *Food supply, Developing countries, Chemical analysis, Soil chemistry, Food processing, Pest control, Aquaculture, Food storage, Plant growth, Growth regulators, Farm crops, Fertilizers, Biochemistry, Nitrogen fixation, Reprints, Global, Chemistry research applied to world needs.

CHEMRAWN (Chemistry Research Applied to World Needs) was conceived as a series of symposia and international conferences whose discussions and published proceedings would help focus attention on critical world problems that could benefit from chemical research. BOSTID was invited to organize a post-CHEMRAWN II workshop to develop the major themes discussed at CHEMRAWN into recommendations for action programs that might be initiated by national governments or development assistance organizations. The four specific topics addressed at the post-CHEMRAWN II workshop were: Soil fertility and plant nutrition; Plant growth regulators and plant-pest relationships; Food science and technology; and Aquaculture and integrated farming systems.

PB84-118181/GAA PC **A05**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Agroforestry in the West African Sahel.
Final rept.
Aug 83, 95p R-51
Grant AID/afr-09290G-SS-1104-00

Keywords: *Agriculture, *Forestry, *West Africa, Developing countries, Degradation, Farm crops, Semiarid land, Soil erosion, Forest trees, Arid land, Conservation, Sahel Region(West Africa), Acacia albida, Acacia nilotica.

This report provides an overview of agroforestry on the Sahel today, the basic problems that are encountered in the current practice of agroforestry, and the opportunities that are available to donors such as AID, to promote agroforestry in the region. Traditional systems of agroforestry represent sophisticated approaches to food production in regions characterized by variable precipitation, high temperature, nutrient-poor soils, crop diseases and crop predators which can dramatically reduce harvests. In many areas of the Sahel, shifts to monocropping and open-field cultivation have resulted in lower potential productivity, reduced groundwater recharge, disruptions of soil ecology and nutrient cycling, and increased soil erosion. This report provides an overview of traditional Sahelian production systems.

PB84-118207/GAA PC **A04**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Calliandra: A Versatile Small Tree for the Humid Tropics (Innovations in Tropical Reforestation).
Final rept.
Jun 83, 60p R-42
Grants AID-ASB-0249-SS-00-1026-00, AID-DAN-5538-G-SS-1023-00
Prepared in cooperation with Perhutani, Jakarta, Indonesia. Library of Congress catalog card no. 83-061908.

Keywords: *Forestry, *Indonesia, Reforestation, *Leguminous plants, Fuels, Seeds, Plant reproduction.

This report describes a tree legume, Calliandra calothyrsus, which in 1936 was transplanted from Central America to Indonesia. Foresters were interested in calliandra as possible green manure or as a shade tree in coffee plantations. In 1960 officials noted that villagers in East Java had adopted calliandra and were cultivating it for their firewood needs. The purpose of this report is to recount Java's experience. It is not intended to recommend it over other reforestation species, but to suggest it as a possible supplementary species.

PB84-118322/GAA PC **A02**/MF **A01**
National Marine Fisheries Service, Charleston, SC. Charleston Lab.
Refrigerated Shelflife of Spanish Mackerel ('Scomberomorus maculatus') and King Mackerel ('Scomberomorus cavalla') Harvested from the Southeastern United States.
Technical memo.,
M. E. Waters. Jun 82, 24p NOAA-TM-NMFS-SEFC-54, NOAA-83110305

Keywords: *Fishes, *Food processing, *Food storage, Assessments, Shelf life, Quality, Odor, Texture, Bacteria, Frozen foods, Food analysis, Food deterioration, Fresh fish.

Freshly caught spanish mackerel and king mackerel were processed into various market forms and stored, either iced or packaged, at 4C. Representative samples of each product form were removed from storage at regular intervals and assessed for quality using organoleptic, microbial and chemical methods. The resultant shelflife of spanish mackerel, after processing, was 9 days for gutted, as well as for headed and gutted (H&G) fish (iced) and 5-6 days for tray-pack skin-on and skinless fillets (4C). The resultant shelflife of king mackerel was 15 days for whole fish (iced) and 9 days for portions (4C).

PB84-118579/GAA PC **E03**/MF **E03**
National Working Party of Deans of Science, Engineering and Commerce, Dublin (Ireland).
Education, Innovation and Entrepreneurship: Recommendations of the National Working Party of Deans.
Final rept. 1980-82.
1982, 24p ISBN-0-86282-030-8
Sponsored in part by National Board for Science and Technology, Dublin (Ireland).

Keywords: *Education, *Great Britain, *Training, Recommendations, Creativity, Educational sociology, Government policies, Inventions, Meetings, Competition, Entrepreneurship, Technology innovation, Curricula.

Five working groups were set up by the (Irish) National Working Party of Deans to study various aspects of the role of the educational system in relation to entrepreneurship and innovation. The object of the study was to contribute to the advancement of society and in particular to improve competitiveness in international trade. A number of recommendations are made regarding: educational curricula modification, teaching staff mobility, interaction with and contribution by industry, state-of-the-art workshops, the sponsorship and recognition of excellence and specific infrastructural and research initiatives. The background to the recommendations is discussed in terms of three important sectors, namely education, government and industry. The various issues involved in creating innovation policies, strategies and actions are outlined.

PB84-118678/GAA PC **E04**/MF **E01**
Osaka Municipal Urban Engineering Information Center (Japan).
Osaka and Its Technology, Number 4, 1983.
1983, 53p
Color illustrations reproduced in black and white.

Keywords: *Urban planning, *Japan, Air pollution, Plant growth, Metals, Plankton, Estuaries, Sea walls, Fire extinguishers, Buildings, Monitoring, Fishes, Toxicity, Osaka(Japan), Ocean waste disposal, Waste recycling.

Contents:
Relationship between the growth activity of plants and air pollutants in Osaka;
Contents of heavy metals and synthetic organic compounds in plankton from the estuary and harbor area in Osaka City;
Construction of waste disposal site by sea-filling and measures for environment preservation;
District information system for Osaka City;
Development of a fog stream-fire extinguishing system for medium-and high-storied buildings;
Monitoring system of acute toxicity upon the breathing rate, heart beat and avoidance reaction of fish.

PB84-118819/GAA PC **E06**/MF **E06**
National Board for Science and Technology, Dublin (Ireland).
Expertise Ireland: Directory of Irish Expertise for Technical Cooperation and Development,
D. O'Doherty, and L. Clifford. c1980, 92p

Keywords: *Technical assistance, Technology, Scientists, Scientific societies, *Ireland, Developing countries.

This Directory is the first effort to outline technological capabilities for the administrators and decision-makers of the developing countries and the international organizations. The National Board for Science and Technology, together with other sister organizations particularly concerned with development cooperation, are conscious that the resources of manpower and knowledge which have been built up during recent and continuing development experience should be available to the developing countries.

PB84-119007/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Technologies from Developing Countries (II).
Development and transfer of technology series no. 7.
Jun 81, 73p UNIDO-ID/246
See also PB-295 656. Errata sneet inserted.

Keywords: *Technology transfer, *Textile industry, *Constructrion, *Food, Chemical compounds, Drugs, Textiles, Cement, Construction materials, Food industry, Agricultural machinery, Oils, Fats, Paper industry, Rural areas, Transportation, Developing country application, Energy requirements.

The collection and dissemination of information on alternative technologies are essential prerequisites for the selection of alternative techniques and processes for production operations. This assumes particular significance in the context of technological absorption, adaptation and innovation in the developing countries and the use of techniques and processes more appropriate to socio-economic objectives and circumstances in these countries. An attempt has been made in this volume to compile information on technologies which have been developed in certain sectors in developing countries and which can be acquired from sources in these countries. In preparing this volume, UNIDO undertook a survey of selected research and development institutes in developing countries through a questionnaire. In most cases all information received on a given technology or institute has been reproduced without selection. In a few cases a selection had to be made because of the large amount of information received not always pertinent to the subject. In the case where no or not enough information on technologies had been received through the UNIDO survey other sources have been used. This volume is divided into two sections: section A describes the technologies, and section B the research and development institutes where the products and processes were developed.

PB84-119031/GAA PC **E05**/MF **E05**
National Board for Science and Technology, Dublin (Ireland).
Biotechnology Trends: Chemicals, Pharmaceuticals, Healthcare and Food Processing.
c1981, 61p ISBN-0-86282-001-4

Keywords: *Drugs, *Food processing, Technology, Forecasting, Trends, Utilization, Medical services, Fermentation, Enzymes, Marketing, Economic analysis, State of the art.

The report is a preliminary study of the application of Biotechnology to two sectors viz Chemicals, Pharmaceuticals and Healthcare, and Food Processing and includes a state of the art review of current and expected developments internationally in the two sectors, a technological forecast of future trends and a study of possible opportunities in relation to such technological development in Ireland. In the review of international developments each sector is divided into sub-sectors and industries and the application of the technology is considered in relation to each division. Thus chemicals are divided into commodity and fine chemicals with the latter being sub-divided into product groups such as steroids, antibiotics, etc. The level of technological development is indicated along with market data and technological advances are discussed in relation to their economics.

PB84-119262/GAA PC **A07**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Managing Tropical Animal Resources: Little-Known Asian Animals with a Promising Economic Future.
Final rept.
Jun 83, 148p R-46
Grants AID-ASB-0249-SS-00-1026-00, AID-DAN-1538-G-SS-1023-00
Library of Congress catalog card no. 83-061909.

Keywords: *Livestock, *Animal husbandry, Swine, Wildlife, Management, Breeding, Genetics, Tropical regions, Animal behavior, Utilization, Asia, Banteng cattle, Habitats.

This report studies banteng cattle, the maura, guar, mithan, kouprey, anoa, tamaraw, yak, and babirusa -- animals that are unfamiliar to international animal science. This report aims to kindle awareness of the possible promise and to stimulate their introduction into projects in the world's animal research facilities. Development agencies should regard the local species detailed in this report as important genetic material for bolstering the long-term success of domestic livestock breeding programs.

PB84-119312/GAA PC **E07**/MF **E01**
Argonne National Lab., IL.
Evaluacion de Recursos Peruanos de Biocombustible y Alternativas (An Assessment of Peruvian Biofuel Resources and Alternatives),
J. P. Harper, W. Smith, and E. Mariani. Nov 83, 129p ANL/EES-TM-86
Text in Spanish.

Keywords: *Biomass, *Fuels, Assessments, Agricultural wastes, Wood wastes, Marketing, Technology, Substitutes, Charcoal, Forestry, Anaerobic processes, Translations, Cogeneration, Renewable energy sources, Fuel substitution, Alcohol fuels.

Comprehensive assessment of the biofuel potential of Peru is based on: determination of current biofuel utilization practices, evaluation of Peruvian biomass productivity, identification of Peruvian agricultural and forestry resources, assessment of resource development and management concerns, identification of market considerations, description of biofuel technological options, and identification of regional biofuel technology applications. Nine biofuel technology options for Peru are identified: (1) small-to-medium-scale gasification, (2) a wood waste inventory, (3) stationary and mobile charcoal production systems, (4) wood distillation, (5) forest resource development and management, (6) electrical cogeneration, (7) anaerobic digestion technology, (8) development of ethanol production capabilities, and (9) agricultural strategies for fuel production. Applications of these biofuel options are identified for each of the three major regions -- nine applications for the Costa Region, eight for the Sierra Region, and ten for the Selva Region.

PB84-119791/GAA PC **E04**/MF **E04**
Commission of the European Communities, Luxembourg.
Electrical Stimulation and Hot Boning: Effects on Meat Quality Attributes,
C. Valin, and A. A. Taylor. c1983, 60p EUR-8075-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B. P. 1003, Luxembourg.

Keywords: *Food processing, *Electric power, Temperature, Electric equipment, Food sanitation, Color, Quality, Bacteria, Safety, Slaughter houses.

The report describes the potential of hot processing techniques within the meat industry. The hygienic aspects of using electrical stimulation and hot boning techniques are discussed and the need for further work on the micro-biological condition of the carcasses is stressed. Standardisation of experimental techniques is also required. The effect of hot boning and electrical stimulation on various factors affecting meat yield such as evaporative weight loss, amount of meat left on bones and trimming of fat are discussed. (Copyright (c) ECSC-EEC-EAEC, Brussels-Luxembourg, 1983.)

PB84-121813/GAA PC **E03**/MF **E03**
Sussex Univ., Brighton (England). Inst. of Manpower Studies.
Human Resources Planning: The Key to Full Employment,
K. D. Grimm. c1981, 18p*

Keywords: *Employment, *Education, Planning, Career development, United States, Policies.

In this article, the author critically examines some basic tenets on which US employment policies have been based and suggests that comprehensive economic planning is the only viable alternative to bring about sustained full employment. Copyright (c) 1981, Institute of Manpower Studies.

PB84-122092/GAA PC **A09**/MF **A01**
National Bureau of Standards, Washington, DC.
Behavior of Concrete Block Masonry Walls Subjected to Repeated Cyclic Displacements,
K. Woodward, and F. Rankin. Oct 83, 180p NBSIR-83-2780
Sponsored in part by Bureau of Mines, Washington, DC.

Keywords: *Concrete, Cyclic loads, Cracks, Strain measurement, Fatigue limit, Strain rate.

An experimental investigation into the behavior of unreinforced, ungrouted concrete block masonry walls subjected to repeated in-plane cyclic displacements was undertaken. A total of 15 walls were tested of which 10 were 64 in. x 64 in. planar walls and 5 were 64 in. higher corner walls having equal leg lengths of 48 in. The primary parameter varied in the investigation was loading history. Monotonic tests at both slow and rapid strain rates were done. The cyclic tests included fully reversed displacement patterns and reversed displacement patterns superimposed on static displacement offsets. The cyclic tests included at least 100,000 repetitions. The test results indicated a pronounced effect of loading history on the wall performance, but only at load/displacements nearing the load capacity failure point.

PB84-122555/GAA PC **A02**/MF **A01**
Texas A and M Univ., College Station. Sea Grant Coll. Program.
Shrimp Mariculture: State of the Art,
A. L. Lawrence, M. A. Johns, and W. L. Griffin. Oct 83, 17p* TAMU-SG-84-502, NOAA-83111401
Grant NA83AA-D-00061

Keywords: *Economic analysis, *Foods, *Aquaculture, Imports, Market value, Life cycles, Ponds, Cost analysis, Production, Demand(Economics), Prices, Developing countries, United States, Tables(Data), Seedstock, Fish bait.

Shrimp is the most valuable U.S. fishery, yet nearly half of the shrimp consumed in this country since 1973 has been imported. The dockside value of shrimp imported for U.S. consumption was $980 million in 1981, compared with domestic shrimp landings valued at $509 million. Shrimp mariculture is emerging as a new agricultural industry for both developed and developing countries worldwide. Not only can it provide food for human consumption and bait for recreational fisheries, but shrimp culture also may provide seedstock to supplement natural populations.

PB84-122746/GAA PC **E05**/MF **E05**
National Traffic Planning and Automation Centre, Trivandrum (India).
National Traffic Planning and Automation Centre - Annual Report of Activities, 1980-1981.
1981, 100p

Keywords: *Traffic engineering, *Urban planning, Urban transportation, Transportation planning.

NATPAC had taken up research and planning studies in different parts of the country at the request of various authorities. In this report, results of various studies conducted during the year 1980-81 are presented. One of the important planning projects carried out was 'Planning of Traffic and Parking Arrangements for Asian Games in Delhi'. Some of the salient findings and results of the studies conducted, which are presented briefly in this report, would be of interest to planners and engineers in the field of traffic and transportation.

PB84-122969/GAA PC **A05**/MF **A01**
North Carolina State Univ. at Raleigh. Productivity Research and Extension Program.
Electronics/Electrical Manufacturing Industry Research Needs.
Interim technical rept. Dec 82-Apr 83,
W. A. Smith, Jr., and R. L. Edwards. May 83, 85p*
CAM-83-2, NSF/MEA-83015
Grant NSF-MEA82-16463

Keywords: *Electric power, *Electronics, Electronic industry, Electric equipment, Electrical industry, Microelectronics, Systems engineering, Manufacturing, Control equipment, Automation, Quality assurance, Computer aided manufacturing.

A panel established a reference base of current activity for electronics manufacturing research by reviewing conventional and microelectronics state-of-the-art; education regarding technology and management; and cooperative efforts being developed. The Department of Defense Electronics Computer-Aided Manufacturing (ECAM) program, the Computer-Aided Manufacturing-International (CAM-I) Electronics Automation Project, and the Microelectronics Center of North Carolina received special attention. Participants were divided into three separate work sessions to identify gaps and issues in technology or operations which limit manufacturing performance in the areas: Logistics and Control Systems; Automation and Assembly; and Quality and Test. The list of priority research issues will be used as the basis to assess the capabilities for responding to needs and to recommend new strategies for meeting the implied challenges. The issues were surprisingly generic in nature with a lack of specific topics in materials, processes, and tooling.

PB84-124148/GAA PC **A05**/MF **A01**
Metropolitan Transit Commission, St. Paul, MN. Transit Development Section.
Guidelines for the Design of Transit Related Roadway Improvements,
D. R. Jessup, G. Van Wormer, and H. Preston. 18 May 83, 93p* MTC-TD-83-01, UMTA-MN-09-0042-83-1
Grant DOT-UMTA-MN-09-0042
Prepared in cooperation with Short-Elliott-Hendrickson, Inc., St. Paul MN.

Keywords: *Buses(Vehicles), *Urban planning, *Transportation management, Traffic control, Route surveys, Passenger terminals, Shelters, Parking facilities, Pavements, Marking, Handicapped persons, Guidelines.

The purpose of this report is to provide a uniform guide to the development and design of various transit related roadway improvements. It is a technical document which reflects the current transit related factors which traffic engineers, architects, planners, and developers should consider during the design process for streets and highways, as well as residential, commercial, and industrial developments. The report covers several topic areas which include: design vehicle operating characteristics; roadway facilities; traffic control devices; park and ride lots; passenger shelters; bus stop design; handicapped transportation; and ridesharing considerations. Much of the information is also useful for school buses and other larger vehicles. In addition, the report identifies, by subject matter, the appropriate transit contact person to answer various transit related questions.

PB84-125020/GAA PC **A13**/MF **A01**
National Science Foundation, Washington, DC. Div. of Industrial Science and Technological Innovation.
Process of Technological Innovation: Reviewing the Literature,
L. G. Tornatzky, J. D. Eveland, and M. G. Boylan.
May 83, 280p* NSF/ISI-83012

Keywords: *Research and development, Organizations, Government policies, Regulations, Patents, Taxes.

Technological innovation is defined and characterized and the view of technology as a disembodied machine or tool is contested. It is pointed out that technology and innovation encompass the organizational setting in which tools are deployed, the work roles of people involved in their use, and the perceptions of actors involved in adoption and implementation. Stages and processes in innovation are discussed, including: (1) basic research, (2) applied research, (3) development, (4) testing and evaluating, (5) manufacturing and packaging, and (6) marketing and disseminating. The limits of disciplinary inquiry for economics, engineering, political science, psychology, and sociology, are considered. Organizational approaches to the study of innovation are explored. Government policies on innovation, incuding regulation, tax, and patent policies, are analyzed.

PB84-125137/GAA PC **A15**/MF **A01**
Montgomery (James M.), Inc., Walnut Creek, CA.
Water Reuse and Recycling in the Food Processing Industry.
Final technical rept. 30 Sep 30 79-30 Sep 81,
L. Russell, K. Conarroe, C. Creson, J. Keller, and L. Esvelt. 21 Jul 83, 327p* W84-00446, , OWRT-C-90180-R(9416)(1)
Contract EPA-14-34-001-9416
Also pub. as Office of Water Research and Technology, Washington, DC. Prepared in cooperation with Esvelt Environmental Engineering, Inc. and California Univ., Berkeley.

Keywords: *Food processing, *Waste water reuse, Industrial water, Water consumption, Food contamination, Public health, Cost analysis, Meat, Poultry, Cooling water, Dairy products, Sugar cane, Sugar beets, Microorganism control(Water), Beverages, Water conservation, Flow charting, Grains(Food), Bakery products, *Waste recycling, Reclaimed water.

The potential for water reuse and recycle in each of the major water using segments of the food industry was evaluated, and projections made for the 1985 and 2000 year water withdrawals in each of the segments with the implementation of water reuse and recycle. The geographic potential for water reuse and recycle was determined in each of the Water Resource Council subregions by past water withdrawals for food processing water availability and types of food processing within the subregion. Product contamination and its impact on the health of the consumer are the major concern in water reuse and recycle in food processing.

PB84-125251/GAA PC **E05**/MF **E05**
National Inst. of Agricultural Engineering, Silsoe (England).
Review of Research on Forage Chopping.
Final rept.,
M. J. O'Dogherty. Nov 81, 56p NIAE-37

Keywords: *Crops, *Agricultural machinery, Cutting machines(Tools), Specifications, Design, Mechanical properties, Knives, Force, Farm crops, Physical properties.

The literature on forage chopping was reviewed (176 references) and the data correlated and collated. the specific energy requirements of forage harvesters were compared and the energy balances of machines evaluated. The effects of the design parameters of cutting heads and crop characteristics on cutting efficiency were examined. Research on the cutting of single stems and its relevance to the cutting of beds of forage material was evaluated. The measurement of the physical and mechanical properties of forage material was discussed. Theoretical analyses of the mechanics of cutting layers of forage were examined and methods of measuring and presenting the distribution of chop length from chopping mechanisms evaluated.

PB84-125426/GAA PC **E05**/MF **E05**
National Inst. of Agricultural Engineering, Silsoe (England).
Conveyor Feeding of Cattle,
M. J. B. Turner. Nov 80, 72p NIAE-34

Keywords: *Livestock, *Agricultural machinery, Automatic control, Feeding(Supplying), Livestock equipment, Storage, Hay, Forage grasses, Silage, Layout, Maintenance, Reliability, Design, Planning, Construction, Operations, Rations.

The advantages of mechanized conveyor feeding are outlined. Various mechanisms are described for conveying and feeding, including monitoring and rationing equipment. Several control systems are considered, ranging from the simple manual starting of each motor to fully automatic and sequenced equipment. The planning, construction, operation and problems encountered with conveyor feeder systems are discussed. It is concluded that a properly designed, installed and maintained coveyor feeding system can provide a very satisfactory means of feeding controlled rations to cattle.

PB84-125756/GAA PC **E15**/MF **E15**
Silk and Art Silk Mills' Research Association, Bombay (India)
Proceedings of the International Conference on Man-Made Fibres for Developing Countries Held at New Delhi on 19-23 January, 1976.
1976, 433p

Keywords: *Fibers, *Textile industry, Developing country application.

Man-made fibres are destined to become more popular the world over as these are the only fibres which can meet the clothing requirements of the growing population. This conference was organized to create an awareness of the opportunities that man-made fibres offer. The proceedings contain 43 technical papers presented by various experts. The topics covered are: International trade in man-made fibres and fabrics; Future of cellulosic man-made fibres in developing countries; Relevance of acrylic fibres; Significance and comparative input needs for cotton and man-made fibre; Advantage and future of blending; Scope & development for and man-made textiles; Economics of cotton textiles vs. man-made textiles; Synthetic fibres and synthetic filament yarn; Technological changes in production of nylon and polyester fibres; Situation of raw materials for polyamide fibre; Economic and technological aspects of future research, Development and production in man-made textiles; Potential warp knitting in developing countries; and High speed spinning.

PB84-125806/GAA PC **E11**/MF **E11**
Central Sheep and Wool Research Inst., Avikanagar (India).
CSWRI (Central Sheep and Wool Research Institute) Annual Report for 1981,
S. D. J. Bohra. Apr 83, 241p
See also PB82-234535.

Keywords: *Animal husbandry, *India, Research projects, Genetics, Education, Animal nutrition, Growth, Animal physiology, Goats, Breeding, Animal diseases, Feeding stuffs, Forage crops, Rabbits, Food composition, Developing country application.

The Central Sheep and Wood Research Institute was set up in 1962 to conduct fundamental and applied research on sheep and wool production and wool utilization, and to impart practical training in this area. This annual report describes the research results in the area of genetics, breeding, nutrition, grassland forage, agronomy, sheep and goat physiology, sheep health, wool science, animal breeding, carpet wool, and extension services.

PB84-125814/GAA PC **E05**/MF **E05**
Structural Engineering Research Centre, Madras (India).
Waffle Shells for Roof and Floor,
G. George, and N. Sethuraman. Oct 81, 65p

Keywords: *Buildings, Shells(Structural forms), Precast concrete.

This report describes the design and construction of the waffle shell system used for roofs and floors. It is based on the funicular shell, which was evolved as a structural element deriving its strength through shape. It develops a state of pure compression under the action of applied loads and is hence ideally suited for concrete construction. The waffle shell system consists of precast funicular shells supported on a grid work of cast-in-situ beams, resulting in a two-way spanning roof or floor which is very economical in the use of steel. The funicular shells and the waffle system have been employed over a large number of projects and individual buildings, testifying to their popularity.

PB84-125830/GAA PC **E10**/MF **E10**
Indian Inst. of Tech., Kharagpur. Dept. of Agricultural Engineering.
Agronomic Studies on the Constraints and Productivity of Rice in Flood-Prone and Water-Logged Areas,
M. D. Reddy. 1982, 218p
Doctoral thesis.

Keywords: *Agriculture, *Rice, *Floods, Plant growth, Yield, Plant genetics, Planting, Fertilizers, Spacing, Survival, India.

The main objectives of this investigation were to identify the causes of low and unstable yield and to find out the extent of damage caused by flash floods; to overcome some of the problems of flood-prone and water-logged areas and to increase the yield of rice and to develop suitable agronomic management practices for realizing the yield potential of improved rice varieties. The experiments proved that the improvement in grain yield of low land rice affected by flash-flood or water-logging is possible by growing improved varieties.

PB84-125848/GAA PC **E03**/MF **E03**
Structural Engineering Research Centre, Madras (India).
Small Capacity Ferrocement Water Tanks,
E. A. Karim, and G. P. Joseph. 1982, 25p

Keywords: *Cements, Water cement ratio, Reinforcing steels, Wire cloth, Fabrication, Cost analysis, *Ferrocement.

Ferrocement is a versatile structural construction material possessing unique properties of strength and serviceability. It is made with closely-knit wire mesh and mild steel reinforcing bars fitted with rich cement mortar. Welded mesh may also be used in place of reinforcing bars. The applications of ferrocement for the fabrication of small capacity water tanks are described in this report. Water tanks made of ferrocement are ideally suited for residential and community uses.

PB84-126010/GAA PC **A12**/MF **A01**
Michigan Univ., Ann Arbor. Dept. of Civil Engineering.
US/Japan Cooperative Research Program in Earthquake Engineering on Repair and Retrofit of Structures. Proceedings of the First Seminar Held at Los Angeles, California on May 15-17, 1980,
R. D. Hanson. May 80, 272p NSF/RA-800811
Grant NSF-CEE78-16730
See also PB84-124759, and PB84-126036.

Keywords: *Construction, *Earthquakes, Earthquake resistant structures, Buildings, Bridges(Structures), Steel construction, Concrete construction, Dynamic structural analysis, *Earthquake engineering.

Papers delivered at the seminar are presented. They address the following topics: seismic strengthening of old buildings with modern codes; aseismic strengthening of reinforced concrete buildings; repair and retrofit of existing steel building structures; retrofitting bridges to increase their seismic resistance; fire testing of epoxy repaired shear walls; and ways to evaluate the seismic safety of houses. It is concluded that repair and rehabilitation techniques for seismically weak and historical buildings are different; the consequences of these differences may have direct application to the design of new buildings to accommodate future strengthening. It is acknowledged that field inspection of construction and workmanship of construction craftsmen have a major influence on the seismic capabilities of completed buildings. It is recommended that a means to improve the quality of workmanship and inspection be developed.

PB84-126911/GAA PC **A07**/MF **A01**
Southern Forest Experiment Station, New Orleans, LA.
Research History and Opportunities in the Luquillo Experimental Forest.
Forest Service general technical rept.,
S. Brown, A. E. Lugo, S. Silander, and L. Liegel. Sep 83, 136p FSGTR/SO-44

Keywords: *Tropical regions, *Forestry, History, Management, Land use, Climate, Hydrology, Water quality, Geology, Soil properties, Plant growth, Reforestation, Mammals, Insects, Birds, Aquatic animals, Damage, Irradiation, Hurricanes, *Puerto Rico, Silviculture.

Tropical forests are being subjected to high rates of deforestation because of increased demand for agricultural land and fuel. Management in many tropical areas is primitive. Because sound management is needed to cope with the reforestation problem, and research data for management is so scattered, this paper is aimed at summarizing major findings of the research activity in Luquillo Experimental Forest.

PB84-127349/GAA PC **E07**/MF **E07**
Edinburgh School of Agriculture (Scotland). Dept. of Economics and Management.
Interaction of Forestry and Farming,
W. E. S. Mutch, and A. R. Hutchison. Oct 80, 120p ECONOMICS AND MANAGEMENT SER-2

Keywords: *Agriculture, *Forestry, Surveys, Farms, Forest land, Questionnaires, Interviews, Attitudes, Employment, Policies, Great Britain, Ownership, Case studies, Scotland.

This investiagtion is concerned with the economic interaction of forestry and agriculture in Scotland and the north of England. The objective is to present factual evidence of the economic results of farming-forestry interaction at the enterprise level, especially where there has been a transfer of land between the two systems and, in some instances, a transfer of labor also.

PB84-127562/GAA PC **A13**/MF **A01**
National Agricultural Library, Beltsville, MD.
Literature for United States Aquaculture: 1970-1982.
Final rept.,
J. B. Forbes, and C. N. Bebee. Oct 83, 294p*

Keywords: *Aquaculture, Aquatic biology, Animal behavior, Breeding, Genetics, Animal diseases, Animal ecology, Animal nutrition, Food processing, Harvesting, Marketing, Production, Economic factors, Fisheries, Aquatic plants.

This bibliography was prepared in support of U.S. Department of Agriculture efforts to implement the National Aquaculture Act of 1980 (P.L. 96-362) and the Agriculture and Food Act of 1981 (P.L. 97-98). It is intended for users in the United States and emphasizes those aquacultural topics which would be of interest to researchers and others engaged in this subject area. Sources of information for data contained in the bibliography are the AGRICOLA data base produced by the National Agricultural Library and the Aquaculture data file produced by the Virginia Institute of Marine Sciences.

PB84-127810/GAA PC **E06**/MF **E06**
Edinburgh School of Agriculture (Scotland).
Trace Element Deficiency in Ruminants.
c1982, 100p ISBN-0-905084-19-5

Keywords: *Livestock, *Animal feeds, Feeding stuffs, Copper, Trace elements, Diets, Absorption, Cobalt, Concentration(Composition), Cattle, Sheep, Selenium, Iodine, Zinc, Molybdenum, Soil properties, Grasses, Scotland, *Ruminants.

This publication presents for the first time, an account of findings on the status and roles of the essential trace elements in ruminant livestock nutrition that is particularly relevant to the occurrence and control of trace element deficiency in Scotland.

PB84-128461/GAA PC **A04**/MF **A01**
California Dept. of Health Services, Berkeley. Viral and Rickettsial Disease Lab.
Viruses in Water and Reclaimed Wastewater.
Final rept. Apr 79-Apr 81,
J. L. Riggs, and D. P. Spath. Dec 83, 51p EPA-600/1-83-018
Grant EPA-R-806563

Keywords: *Viruses, *Water treatment, *Water quality, *Sewage treatment, California, Potable water, Viral diseases, Separation, Sampling, Enteroviruses, Laboratory animals, *Waste water reuse.

A study was initiated to determine the occurrence and concentration of viruses in high quality wastewater treatment plant effluents from two treatment plants in California. Disinfected secondary effluent was compared to disinfected and filtered secondary effluents. Biweekly quantitative data from the two wastewater treatment plants were obtained over a 16-17 month period. Four cell systems were used for virus assays. Studies were conducted to determine the viral etiology of waterborne outbreaks of acute infectious nonbacterial gastroenteritis. During the period of this report five outbreaks of acute gastroenteritis were suspected to be of waterborne origin. Evidence of viral etiology was obtained in three of the five outbreaks. Cell cultures from chimpanzees, marmosets and monkeys were used in attempts to culture the agents producing gastroenteritis in humans. In no case was a virus isolated nor growth detected.

PB84-128743/GAA PC **E08**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Low-Cost Automation for the Furniture and Joinery Industry,
W. J. Santiano, and H. P. Brion. 1982, 151p UNIDO-ID/154/REV.1

Keywords: *Industrial plants, *Furniture, Industries, Manufacturing, Joining, Developing country application, Low cost.

It is the aim of this manual to show furniture and joinery companies that they can gain the benefits of automation in their factories at relatively low cost and that their own personnel can carry out the installation of automation devices, usually on existing machines.

PB84-128750/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Emerging Photovoltaics Technologies: Implications for Developing Countries.
2 Nov 82, 15p UNIDO-ID/WG.384/2, R-82-33288

Keywords: *Photovoltaic power system, Technology, Utilization, Rural areas, Developing country application.

This paper presents a very brief review of technological advances relating to solar photovoltaic systems and proceeds to consider the implications of those advances for developing countries.

PB84-128842/GAA PC **E04**/MF **E01**
CONCAWE, The Hague (Netherlands).
Guidelines for Recording Industrial Hygiene Data,
D. T. Coker, D. Irvine, B. E. Keal, and J. P. Moore. c1983, 27p CONCAWE-7/83

Keywords: *Industrial plants, Guidelines, Exposure, Health, Epidemiology, Data processing, *Information systems, *Computers, Europe, Computer applications.

The report reviews the objectives of an industrial hygiene workplace exposure monitoring data system, and discusses differing types of computer-based systems currently used within the European petroleum and petrochemical industry. The report also gives guidelines for the design of a data system, at the same time reviewing the input and output elements that should be considered in order to produce an efficient and flexible system to meet individual circumstances. (Copyrights (c) CONCAWE Den Haag October 1983.)

PB84-128883/GAA PC **A04**/MF **A01**
Mississippi-Alabama Sea Grant Consortium, Ocean Springs, MS.
Growth, Nutrient Uptake and Carbohydrate Production in Laboratory Cultures of Spirulina Major (Cyanophyceae).
Final rept. Jan 81-Dec 82,
C. F. Rhyne, and L. A. Crump. Jul 83, 52p MASGP-82-032, NOAA-83120802
Grant NA81AA-D-00050
Prepared in cooperation with Jackson State Univ., MS.

Keywords: *Algae, *Aquaculture, *Waste water reuse, Nutrients, Carbohydrates, Biomass, Waste water, Sea water, Mixtures, Inorganic phosphates, Ammonium compounds, Inorganic phosphates, Chemical analysis, pH, Yield, Substrates, Salinity, Temperature, Eutrophication.

The basic aim of this study was to develop and analyze a photo-synthetic bioconversion system utilizing marine algae as the basis for the production of a useable feedstock (algae food reserve) by achieving the following: Analysis of various marine algae found along the Mississippi and Alabama coasts based on growth potential in a wastewater/seawater mixture. Evaluation of procedures used in maximizing production of food reserves in the selected marine algae. Study of the wastewater treatment relative to NO3, NH4 and PO4 utilized by the algae biomass.

PB84-129030/GAA PC **A20**/MF **A01**
California Univ., Riverside.
Utilization of Municipal Wastewater and Sludge on Land, Proceedings of the 1983 Workshop.
Final rept. Sep 82-31 Aug 83,
A. L. Page, T. L. Gleason, III, J. E. Smith, Jr., I. K. Iskandar, and L. E. Sommers. Jan 84, 461p EPA-600/9-84-003
Contract EPA-R-810529
Prepared in cooperation with Purdue Univ., Lafayette, IN., and Cold Regions Research and Engineering Lab., Hanover, NH.

Keywords: *Sewage disposal, *Land use, Constraints, Microorganisms control(Sewage), Ground water, Bacteria, Viruses, Protozoa, Public health, Economic factors, Metals, Nitrogen, Removal, Organic compounds, Risk, Organic loading, Heavy metals.

A workshop on Utilization of Municipal Wastewater and Sludge on Land was held in Denver, Colorado from February 23 through 25, 1983. Researchers and practioners of land treatment, totaling 203 in number and from the United States and other countries were invited to attend and evaluate advances in the land treatment technology during the past decade. The reports of the conference include position papers on institutional constraints, hydrologic and nutrient management, pathogens, metals, organics, engineering and economics and public health aspects.

PB84-129063/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Factors Affecting the Feasibility of Small Scale Water Power Plants,
A. Vinjar. 4 Aug 83, 38p UNIDO-ID/WG.403/22, R-83-59104

Keywords: *Hydroelectric power, Hydroelectric power generation, Feasibility, Cost estimates, Fixed investment, Developing country application.

The report covers: (1) engineering and feasibility study for water based electric power station (2) costs estimate of projects (3) project evaluation (4) capital costs versus consumers purchasing capacity (5) main factors affecting the feasibility (6) simplified planning of small scale water power projects.

PB84-129071/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Development of African Capacities for the Design and Manufacture of Basic Agricultural Equipment.
Sectoral Working paper series No. 2,
M. Ogier. 19 Mar 83, 63p UNIDO/IS.379, R-83-53923

Keywords: *Africa, *Agricultural machinery, *Technology assessment, Technology innovation, Manufacturing, *Hand tools, Product development, Production methods, Developing country application.

The report covers current manufacturing structures for the production of agricultural equipment: manufacture by handicraft, small scale industry and large-scale local enterprises, domestic production of hand tools and simple equipment; animal powered cultivating equipment; portable and stationary equipment with ancillary motors; simple tractors, engineering design for local manufacture, choice of technology; training. Additional references: capital goods, agricultural machinery.

PB84-129261/GAA PC **E04**/MF **E01**
New Zealand Energy Research and Development Committee, Auckland.
Fermentation Studies on Extracts of Beet,
J. M. Smith. Mar 83, 37p R-90
Prepared in cooperaton with Lincoln Coll. (New Zealand). Dept. of Microbiology.

Keywords: *Sugar beets, Substrates, Sucrose, Yeasts, Saccharomycetes, Bacteria, Fungi, Control, Production, Efficiency, Fuels, New Zealand, *Biomass, Chemical reactions, Plant extracts.

Fodder beet juice and sugar beet juice were found to be good substrates for the production of ethanol. Two strains of flocculent yeast were selected to ferment fodder beet juice and sugar beet juice. Beet juice was found to have a high level of contaminating microorganisms. Elimination of these microorganisms from the beet juice before fermentation was an essential step if high fermentation efficiencies were to be achieved. Continuous fermentation of fodder beet juice and sugar beet juice provided higher fermenter productivities than rapid batch fermentation. Under New Zealand farming conditions, it is estimated that 4000 litres of ethanol per hectare could be produced on a nationwide basis.

PB84-129287/GAA PC **A03**/MF **A01**
Office of Water Research and Technology, Washington, DC.
Recent Advances in Reverse Osmosis and Electrodialysis Membrane Desalting Technology.
Journal article,
M. E. Mattson, and M. Lew. c1982, 27p W84-00531
Pub. in Desalination, v41 n1 p1-24 Apr 82.

Keywords: *Desalination, Sea water, Technology, Brackish water, High temperature tests, Forecasting, Reviews, Ultrafiltration.

The potential impact of recent developments in both reverse osmosis and electro-dialysis membrane desalting technology is summarized. Particular emphasis is given to the status of advanced technology reverse osmosis membranes with chlorine resistance having single pass seawater desalination capability. Membranes capable of using low operating pressures for brackish water desalting are also reviewed. Results obtained with large prototype reverse osmosis modules and their potential effect on lowering plant capital costs are presented. Possible elimination of acid and use of ultrafiltration as the predominant pretreatment step in seawater desalination plants are also described. Recent developments in the high temperature electrodialysis program for seawater desalting and in the use of newly developed anion membranes for brackish water desalination are reviewed. Potential impacts on future membrane desalination R&D activity are discussed.

PB84-129584/GAA PC **A05**/MF **A01**
Minnesota Dept. of Energy and Economic Development, St. Paul. Energy Div.
Planning and Zoning for Solar Access: A Guide for Minnesota Communities.
Sep 83, 91p* DEED-09-83
Contract DE-FG45-80CS69105

Keywords: *Solar energy, *Urban planning, *Land use, Guidelines, Policies, Public relations, Communities, Neighborhoods, Vegetation, Zoning, Minnesota, Solar architecture, Solar collectors, Residential areas.

The purpose of this guide is to provide information on solar access to planning and zoning staff and elected officials to enable them to remove barriers to solar energy use, to facilitate good solar access in new areas of development by modifying zoning and subdivision regulations, and to provide firmer guarantees of solar access such as solar access permits. The guidebook includes background information on solar energy systems and solar geometry. Basic solar access public issues are discussed and sample goal and policy statements are provided. The chapter on removing barriers to solar energy use considers definitions, use designation, and zoning revisions such as exempting solar systems from height and setback requirements. Solar access protection techniques covers easements and solar access permits for existing developments and also for undeveloped areas. Model language is provided.

PB84-129592/GAA PC **A02**/MF **A01**
Economic Research Service, Washington, DC. Natural Resource Economics Div.
Pesticide Use and Practices, 1982,
M. Duffy. Dec 83, 20p AIB-462

Keywords: *Safety, *Pesticides, Utilizations, Surveys, Safety devices, Farm crops, Economic analysis.

Pesticide use varies considerably by crop, according to the Economic Research Service's 1982 Crop and Livestock Pesticide Usage Survey. Eleven percent of farmers who responded used professional scouting for pest problems, 59 percent self scounted their fields, and 12 percent were aware of beneficial insects and diseases. The extent of no- or reduced-till systems varied by crop. Almost 70 percent of the farmers with livestock used insecticides for livestock insect control. A majority of the respondents used common pesticide application safety equipment and 15 percent used specialized safety equipment.

PB84-129725/GAA PC **A04**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Manpower Needs and Career Opportunities in the Field Aspects of Vector Biology: Report of a Workshop Held at Washington, DC. and Berkeley Springs, West Virginia, on September 29-October 2, 1982.
Final rept.
Nov 83, 67p 55
Grant AID-DAN-5538-G-SS-1023-00

Keywords: *Health, *Diseases, *Tropical Regions, Tropical diseases, Developing countries, Specialized training, Public health, Meetings, Health manpower education.

This is a report of a workshop held from September 29 to October 2, 1982 in Washington, DC and Berkeley Springs, WVa to discuss some current problems associated with vector biology research. Presentations at the workshop focused on the value of field research, the availability of manpower for field studies of medically important insects and snails, vector field research and control activities funded by domestic and international agencies, and obstacles to career development. Vector-borne diseases continue to threaten social and economic development in many developing countries, yet there is a shortage of field-oriented vector biologists. The workshop report includes the recommendations of the individual working groups on field experience and applications of field research to control problems; training; and employment opportunities. The recommendations focus on ways to ensure that a cadre of expertise will be available in the future to understand and deal with the complex ecological relationships of vectors with human hosts and pathogens that cause such diseases as malaria, dengue fever, filariasis and schistosomiasis.

PB84-129774/GAA PC **A06**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Producer Gas: Another Fuel for Motor Transport.
Final rept.
Nov 83, 111p 51
Contract AID/ta-C-1433, Grant AID-DAN-5538-G-SS-1023-00
Library of Congress catalog card no. 81-834-15.

Keywords: *Fuels, *Renewable energy, Economic analysis, Biomass, Motor vehicles, Technology, Alternate fuels.

The purpose of this report is to introduce gas to researchers, agencies, and institutions engaged in assisting developing countries. The panel demonstrates to decision makers, administrators, and scientists that producer gas technology is worth investigating and hopes, by this report, to encourage increased testing and use of producer gas as an automotive fuel. Producer gas represents an alternative to petroleum for fueling motor transport. It also has important, potential uses to fuel pumps, driers, and electric generators. Used during the fuel shortages of World War II, producer gas is generated from solid fuels such as wood, charcoal, coal, peat, and agricultural residues. Producer gas is made when a thin stream of air passes through a bed of glowing coals. Most of the carbon dioxide and steam are reduced to carbon monoxide and hydrogen, which, when mixed with air, are combustible. This report discusses producer gas technology and its history. The economics, advantages and disadvantages are also given. A comprehensive bibliography on producer gas is available as a companion volume.

PB84-129782/GAA PC **A05**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
U.S.-Indonesia Marine Science Exchange Program, 1982-83, Summary Report.
Final rept.
1983, 92p CIR/BOSTID-83-8
Sponsored in part by Agency for International Development, Washington, DC.

Keywords: *Education, *Indonesia, Ocean environments, Marine biology, Marine geology, Coastal zone management, Primary biological productivity, Water pollution, Aquaculture, Fisheries, Mollusca, Coral, United States.

From June 1982 to June 1983, BOSTID sponsored a U.S. - Indonesia Marine Science Exchange Program which provided support for visits by seven U.S. marine scientists to Indonesia. These scientists presented lectures on topics of interest to Indonesians, gained a better insight into the scientific phenomena of Indonesian waters, and discussed projects that could aid development of marine science in Indonesia. This report is a summary of this activity and uses material presented by the visiting scientists.

PB84-129808/GAA PC **A06**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Alcohol Fuels: Options for Developing Countries.
Final rept.
c1983, 120p ISBN-0-309-03386-1, 33
Contract AID/c-1433, Grant AID-DAN-5538-G-SS-1023-00
Library of Congress catalog card no. 82-062536.

Keywords: *Alcohols, *Fuels, Ethyl alcohol, Methane, Farm crops, Methyl alcohol, Biomass, Sources, Design criteria, Environmental surveys, Economic analysis, Manufacturing, Utilization, Fermentation, Alternate fuels.

This report summarizes information on alcohol fuel technologies for planners, investors, and technical assistance agencies in developing countries. Although the information is primarily aimed at the non-technical reader, it does contain some details of the technologies: references are included for those who wish more specialized information. This report explores the production and use of alcohol fuels and the production of ethanol and methanol. In addition it looks at the social, economic and environmental implications of using alcohol fuels. Positive and negative factors of using alcohol fuels are given. The report includes information on various tropical crops and their conversion to alcohols through both traditional and novel processes.

PB84-129824/GAA PC **A04**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Workshop on Single-Cell Protein: Summary Report.
Final rept.
Sep 83, 72p 83-7
Sponsored in part by Agency for International Development, Washington, DC. Proceedings of a Workshop held at Jakarta, Indonesia, February 1-5, 1983.

Keywords: *Proteins, *Nutrition, Meetings, Developing countries, *Indonesia, Vitamin A, Nutrition, Humans.

This workshop, held in Jakarta, Feb 1-5, 1983, reviewed Indonesian government plans to establish a rural pilot plant to produce single cell protein (SCP) from root crops, primarily cassava. Workshop participants included both Indonesia and U.S. scientists, engineers, economists, and administrators. Inadequate consumption of protein and Vitamin A has plagued Indonesia. Because increased production of conventional protein from agriculture, animals, or marine sources may not be able to satisfy the consumption needs of the growing population, protein produced from nonconventional sources must be further developed. Among these nonconventional sources SCP has a high potential to assist in the alleviation of protein deficiency. SCP can be produced from renewable resources (root crops such as cassava, sweet potatoes) or other biomass or nonrenewable resources (hydrocarbon, petrochemical and industrial wastes). Workshop participants sought to identify steps that must be taken in order to introduce SCP as a protein source. Matters that require further study include: Research on microbes; Production processes; and Utilization of SCP.

PB84-129865/GAA PC **A04**/MF **A01**
National Research Council, Washington, DC.
Workshop on Building Diagnostics Held at Pine Mountain, Georgia on March 5-8, 1983.
18 Aug 83, 70p
Contract NB83-SBCA-2040, Grant NSF-CEE82-13661

Keywords: *Buildings, *Management planning, Technology assessment, Environmental engineering, Diagnosis, Design criteria, Project planning.

This report presents the findings of a workshop on building diagnostics held March 5-8, 1983. Building diagnostics is defined as the use of contemporary methods of measurement and interpretation to improve the performance of buildings. The purpose of the workshop was to identify existing and new instrumentation and measurement technologies. The workshop was part of a larger study by a National Research Council Committee on Building Diagnostics to assess the state of the art of building diagnostics, to develop performance requirements for new diagnostic tools, and to make recommendations for needed research and development programs.

PB84-130053/GAA PC **E07**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
UNIDO (United Nations Industrial Development Organization) Model Form of Licensing and Engineering Services Agreement for the Construction of a Fertilizer Plant Including Guidelines and Technical Annexures.
17 Aug 83, 144p UNIDO/PC.73, R-83-59494

Keywords: *Contracts, *Fertilizers, *Industrial plants, Contract terms, Construction, Engineering, Technology transfer, Developing country application.

The report discusses contracts for the licensing and engineering services needed for the construction of a fertilizer plant. It presents a UNIDO model form of such an agreement containing (1) general and specific guidelines (2) the text of the agreement, consisting of eleven articles and (3) technical annexures.

PB84-130319/GAA PC **E05**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Manual on Upholstery Technology,
D. P. Cody. 1982, 99p UNIDO-ID/275

Keywords: *Furniture, *Textile industry, Fabrics, Textiles, Technology, Equipment, Industries, Developing countries, Developing country application.

The following topics are discussed: (1) upholstery work--traditional and modern; (2) materials and techniques--suspension systems, cushioning; (3) fabrics, textiles; (4) production technology--methods and equipment; (5) factory organization and management; planning, production control; a small upholstery production unit; (6) processing of flexible plastic foam (polyurethane); and (7) performance testing.

PB84-130335/GAA PC **E06**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Manual on the Production of Rattan Furniture,
D. P. Cody. 1983, 119p UNIDO-ID/299

Keywords: *Furniture, *Industrial plants, Processing, Manufacturing, Equipment, Machinery, Developing countries, Developing country application.

The following topics are discussed (1) the rattan plant (2) rattan processing and harvesting; preliminary processing; conversion; (3) marketing (4) product design considerations (5) the furniture manufacturing process (6) project engineering, machinery, equipment, factory layout and factory organization (7) management functions; and manpower needs.

PB84-130343/GAA PC **E10**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Manual for Planning the Development of Capital Goods Industries,
M. M. Luther. 1983, 204p UNIDO/IO.548, R-83-57501

Keywords: *Financial management, *Economic development, *Turkey, *Industrial development, Developing country application.

This is a Handbook on development planning for capital goods industries in developing countries (based on project experience in Turkey) - covers (1) objectives of capital goods development project (2) conceptual frameworks priorities and strategy (3) classification and codification of capital goods (4) methodology for (a) process industries, (b) general purpose machinery, (c) the transport sector.

PB84-130350/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Meeting of the Expert Group to Exchange Experiences in the Developing Countries (1st), Held in Vienna, Austria on 7-11 December 1981.
31 Dec 81, 32p UNIDO/PC.30, R-81-33841

Keywords: *Fertilizers, Developing countries, *Industrial plants, Meetings, Specialized training, Developing country application.

UNIDO convened the First Meeting of the Expert Group to exchange experience in the construction and operation of fertilizer plants in developing countries. The Terms of Reference for the exchange and transfer of experiences program recommended by the Consultation were as follows: (1) The organization of a number of in-plant training programs in selected developing countries on plant operation and maintenance; (2) The convening of technical meetings at the managerial level on project and plant management, operational problems and technological development; and (3) The provision of expert services and training facilities on plant and equipment design and on ways to improve capacity utilization.

PB84-130467/GAA PC **A02**/MF **A01**
Environmental Research Lab.-Duluth, MN.
Agrochemical Hazards in Aquatic Systems and Evaluation of Such Hazards with Emphasis on Developing Countries,
A. E. Lemke. 1983, 21p EPA-600/D-84-020

Keywords: *Fishes, *Proteins, *Water pollution, Fertilizers, Pesticides, Foods, Fishes, Shellfish, Sources, Toxicity, Utilization, Agricultural products, Bioaccumulation, Eutrophication.

Many developing countries are lacking protein in the diets of their population. Aquatic systems are good sources of protein in many areas with fish and shellfish as the main sources. The misuse of agrochemicals can directly or indirectly affect the use and suitability of these protein sources as food. Problems are found in three main areas: eutrophication which changes species production, direct toxicity to aquatic species and bioconcentration of various materials to excessive amounts. The best solution is judicious purchase and use of agrochemicals. Lacking this, testing is necessary to predict and prevent problems and several methods will be enumerated. Particular emphasis will be placed on testing facilities and personnel. A substantial bibliography will be included.

PB84-130616/GAA PC **A05**/MF **A01**
Minnesota Univ., Minneapolis. Dept. of Agricultural and Applied Economics.
Food Policies in Developing Countries.
Foreign agricultural economics rept.
Dec 83, 76p FAER-194

Keywords: *Food, *Africa, Senegal, Kenya, Tanzania, Economic development, Prices.

Developing nations find national food policies a necessary, but not sufficient, condition for economic development, according to this survey of 21 nations, including case studies of Kenya, Tanzania, and Senegal. Use of such policies does not affect development as much as the extent to which they are used. Increasing farmer welfare and achieving national food self-sufficiency were the two food policy objectives most often claimed by the developing nations. Also claimed were consumer welfare, stable prices, conservation of foreign exchange, and food security. Government budget constraints formed the greatest roadblocks to effective food policy.

PB84-130657/GAA PC **E08**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Directory of Industrial and Technological Research Institutes: Industrial Conversion of Biomass.
24 Feb 83, 157p UNIDO/IS.372

Keywords: *Biomass, *Industrial plants, Technology, Fuels, Research, Chemical feedstocks, Listings, Developing country application.

There are of course many guides to institutes working on development of new and renewable energy sources. This directory is intended to provide additional in-depth information on on-going projects, including stage of development (laboratory, pilot plant, or industrial level) and scale of production (household, village, industrial). The directory is envisaged as a starting point for promoting international co-operation in the industrial conversion of biomass. The information was obtained by questionnaires circulated early in 1982. It was coded to allow for the generation of a subject index, and in-put into the LINK Data Base for ease in producing the directory and in up-dating the information as required.

PB84-130673/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Waste and Dust Extraction Systems,
G. Anselmi. 12 Sep 83, 42p UNIDO-ID/WG.369/12, R-83-61696

Keywords: *Woodworking, *Wood wastes, *Health, Design criteria, Performance evaluation, Pipes, Separators, Extractors, Industrial wastes, Developing country application, Suction hoods.

In the modern woodworking industry, particular attention is paid to the problem of dust and waste extraction. Sawing, squaring, planing, polishing machines, etc., produce waste of various kinds, chips, shavings and dust, which must be removed both from the machine and from the work environment and should later be recovered, hopefully, for industrial or energy purposes. Today, priority is no longer given to the machine which, however, should be kept clean in order to ensure a smooth operation and prevent damage that may possibly involve delicate automatisms, but- reasonably enough - to man and to the ways in which he may be enable to work in an environment as clean and as healthy as possible. In order to achieve this goal, one must: extract the waste from where it has originated, convey it through a conduct system, and deposit it in a suitable place. These operations give rise to a suction plant and this is also the topic of this lecture.

PB84-130681/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Why and How Wood Dries,
R. Cividini. 12 Sep 83, 37p UNIDO-ID/WG.369/11, R-83-61695

Keywords: *Drying, *Wood, Humidity, Moisture content, Temperature, Lumber, Air flow, Drying apparatus, Hardwoods, Softwoods, Developing country application.

Contents:
- Why and how wood dries;
- Drying means;
- Natural seasoning;
- Kiln-drying;
- Automation of the drying process;
- Problems connected with the choice of the drier.

PB84-130699/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Impact of Microelectronics on Biomedical Applications in Developing Countries,
C. L. Claeys. 17 Jun 83, 26p UNIDO/IS.392, R-83-57316

Keywords: *Health, *Electronics, Trends, State of the art.

Contents: State of the art and new trends; Relevance to developing countries, Aspects of biomedical engineering, Situation in developing countries; Requirements for introduction in developing countries; Relation between the medical and the electronic professions; Examples of practical applications; Future actions and conclusions.

PB84-130707/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Mechanical Wood-Processing Industries in Developing Countries. Problems - Causes - Search for Solutions,
J. Swiderski, and G. Heilborn. 17 Jun 83, 58p UNIDO-ID/WG.395/5, R-83-57337

Keywords: *Wood products, Manufacturing, Plywood, Veneers, Raw materials, Sawmills, Education, Technology assessment, Particle boards, Developing country applications.

The report covers sawmilling: main problems, low recovery from raw material timber; choice of equipment; wood technology; training, plywood and veneer manufacture, reconstituted wood panels: particle board, fibreboard, main constraints, search for solutions. Bibliography. Additional reference: tropical timber.

PB84-130715/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Some Aspects of Export Packaging of Furniture,
J. Selin. 29 Jun 83, 28p UNIDO-ID/WG.378/3, R-83-57780

Keywords: *Furniture, *Packaging, Containerizing, Compacting, Exports, *International trade, Regulations, Warehouses, Developing country application.

The packaging of furniture for export is one of the most difficult problems in packaging technology. Most of the damage to furniture during transport and storage occurs because of incompetent and rough handling. In most cases, the main reason for damage to furniture packed for export is given as the result of the inferior quality of the packaging material available. Both furniture manufacurers and furniture dealers often have inadequate warehouse facilities.

PB84-130723/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Contractual Arrangements for the Transfer of Technology in the Fast Food Sector,
J. Cieslik. 7 Sep 83, 29p UNIDO-ID/WG.405/2, R-83-61526

Keywords: *Food services, *Contracts, Food dispensing, International trade, Food services management, Marketing, Developing country application, Franchising.

The expansion of transnational fast food chains, although concentrated developed countries, has been recently visible in developing countries as well, especially in Latin America and South-east Asia. Large fast food chains either operate their outlets abroad or franchise the system to the independent restaurant operators. In addition, mixed-type arrangements are used in this sector i.e. equity participation in combination with franchise agreement. Prior to formulating specific regulations and guidelines, developing countries should define their general attitude towards transnational fast food chains. Taking into account the economic, financial and socio-cultural implications of the fast food chain operations, it is recommended that all contractual arrangements used in this sector are subject matter of scrutiny by the technology transfer registries in developing countries. Franchise contracts should be always evaluated within broader context of the overall relationship between franchisor and franchisee. The principal differences among various types of franchises should also be taken into account.

PB84-130731/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Interregional Cement Technology Forum, Benghazi, Libyan Arab Jamahiriya, 13-20 April 1982.
24 Jan 83, 42p UNIDO/IO.535, R-83-50632

Keywords: *Cement, *Technology assessment, Excavating equipment, Grinding mills, Kilns, Refractory materials, Limestones, Production control, Developing country application.

The report covers organization of the forum; comments and observations, gives summaries of papers presented and discussions, with reference i.a. to mining, factory establishment, grinding, limestone, kilns, training centers, pollution control, refractory materials, maintenance and repair.

PB84-130749/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Small Hydro Power Development. 1. Methodology for Feasibility and other Studies Appropriate for Small Hydro Power Development. 2. Local Manufacture of Small Hydro Power Equipment (Turbine). 3. Ways and Means of Cost Reduction Compatible with Viability and Utility Requirements.
9 Aug 83, 18p UNIDO-ID/WG.403/30, R-83-59212

Keywords: *Hydroelectric power, Feasibility, Manufacturing, Hydraulic turbines, Cost engineering, Small-scale hydroelectric power plants, Developing country application.

The report covers (1) methodology for feasibility studies and other studies appropriate for SHP (2) domestic production of SHP equipment turbines (3) ways and means of costs reduction compatible with viability and utility requirements.

PB84-130764/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Some Considerations about a Practical Approach to the Development of Technical Infrastructure for Microelectronics,
G. F. de la Garza. 14 Jul 83, 19p UNIDO-ID/WG.401/6, R-83-58464

Keywords: *Electronics, *Research and development, Technology, Development, Developing country application.

The report covers: (1) factors in development of applications of microelectronics; specialized engineering capacity; engineering design; software development; components manufacture and standardization; cooperation between electronics industrys and research centres; management development; (2) micro-integrated circuits design and production; (3) proposals for regional microelectronics development centers.

PB84-130772/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Microelectronics and Developing Countries. Towards an Action-Oriented Approach.
10 Feb 83, 18p UNIDO-ID/WG.384/5/REV.1, R-83-51698

Keywords: *Electronics, *Industrial development, Microelectronics, Employment, Foreign trade, Policies, Technology innovation, Technology transfer, Specialized training, Developing country application.

The report covers (1) impact of microelectronics on employment, capital, foreign trade and society; (2) components of a microelectronics policy framework in DCs: monitoring and awareness; endogenous capacities and applications; implementation review; efforts to develop applications; building up of knowhow and technological capabilities; choice of technology; technology transfer; education and training; (3) international cooperation.

PB84-130905/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Development of Drugs Based on Medicinal Plants.
1 Sep 83, 23p UNIDO-ID/WG.393/11, R-83-59929

Keywords: *Drugs, *Medicinal plants, Manufacturing, Developing country application.

Contents:
- The use of medicinal plants--(Patterns of pharmaceutical development from plants and the consumption of plant-based drugs);
- Pharmaceutical manufacturing from medicinal plants--(Production of therapeutic agents from plants, technology requirements, and supply of plant raw materials);
- Conclusions.

PB84-130913/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Cost Reduction Considerations in Small Hydropower Development,
D. A. Minott, and R. A. Delisser. 4 Aug 83, 16p UNIDO-ID/WG.403/21, R-83-59103

Keywords: *Hydroelectric power, Cost engineering, Development, Hydroelectric power generation, Small-scale hydroelectric power plants, Developing country application.

The report covers: (1) general concepts: physical components of MHG facilities; site assessments, hydrology, maps, feasibility studys, engineering design, social aspects, economic aspects, detailed civil engineering, tendering, construction, etc.; (2) some ways of reducing capital costs in developing countries: penstocks, speed control, turbines and reverse pumps, voltage control devices, standardization of parts and reduction of equipment variety; (3) other cost reduction considerations.

PB84-130921/GAA PC **E06**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Items which could be Incorporated in Contractual Arrangements for the Transfer of Technology for the Manufacture of those Bulk Drugs/Intermediates Included in UNIDO's (United Nations Industrial Development Organizations) Illustrative List.
26 May 83, 125p UNIDO-ID/WG.393/1, R-83-56382

Keywords: *Contracts, *Technology transfer, *Industrial development, *Drugs, Contract terms, Developing countries, Production planning, Licenses, Personnel, Drugs.

UNIDO has been requested to prepare a document on the various contractual conditions, and variations thereof including background notes, related to contractual arrangements for the transfer of technology in the pharmaceutical industry. This document has been prepared in line with the recommendations referred to and in co-operation with an ad hoc panel. It is intended to provide guidance for the negotiation and drafting of agreements for the transfer of technology for the manufacture of bulk drugs or intermediates, for new entrepreneurs or those who have already a plant in operation and would like to add new products or adopt a new technology.

PB84-130939/GAA PC **E05**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Energy Development and Industrialization.
6 Oct 82, 86p UNIDO/OED.135, R-82-31070
Portions of this document are not fully legible.

Keywords: *Energy source development, *Industrial development, *Energy management, *Energy, Developing countries, Industries, Energy methods, Coal, Nuclear energy, Solar energy, Hydroelectric power generation, Developing country application.

The report covers (1) the broad perspective and setting of the problem; relevant role of UNIDO; (2) main issues and goals of an energy program; (3) the potential contribution of (a) various energy sources: fossil hydrocarbons, coal, nuclear energy, hydroelectric power, biomass; (b) new and renewable energys; (4) industry for energy; fuels processing, equipment production; (5) industrial energy management; (6) programming aspects, activities, international cooperation, etc.

PB84-130947/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Promotion of Commercially Less Accepted Species (Timber) of Wood,
O. P. Hansom. 25 May 83, 45p UNIDO-ID/WG.395/1, R-83-56335

Keywords: *Marketing, *Wood, Classifications, Structural timber, Wood products, Developing country application.

The report covers (1) designation, definition, occurrence and grouping of such species of timber (2) uses: classification, log exports; sawnwood, veneer, plywood, wood products; energy and fuelwood (3) industrial marketing (4) promotional activities (5) a strategy for forest product processing; forestry aspects, economic aspects; incentives and (6) an action programme.

PB84-130954/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Application of Wind Power for Ship's Drive,
B. Mazurkiewicz. 22 Oct 82, 25p UNIDO-ID/WG.375/10, R-82-31875

Keywords: *Meteorology, *Ships, *Wind energy, Marine propulsion, Technology assessment, Developing country application.

The report covers background of revived interest in the use of wind energy based on need to reduce fuel costs; engineering design for hulls suitable for introduction of sails, existing tendencies concerning large merchant vessels; problems and solutions; experience in various countries and sails for fishing vessels, diagrams of various sailboats.

PB84-130970/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Boatbuilding and Repair Yard for Wooden Fishing Boats,
B. Mazurkiewicz. 22 Oct 82, 25p ID/WG.375/8, R-82-31870

Keywords: *Boats, *Construction, *Ships, Structural design, Specifications, Personnel, Production management, Developing country application.

This publication provides the specifications, diagrams, and procedures of a repair yard. Other functions are also covered such as number of employees required, equipment required, and dimensions of the necessary buildings.

PB84-131002/GAA PC **E12**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
UNIDO (United Nations Industrial Development Organization) Model Form of Cost Reimbursable Contract for the Construction of a Fertilizer Plant Including Guidelines and Technical Annexures.
1 Jun 83, 279p UNIDO/PC.26/REV. 1, R-83-56696

Keywords: *Contracts, *Fertilizers, *Industrial plants, Contract terms, Construction, Developing country application.

The report presents a UNIDO model form of a cost reimbursable contract for the construction of a fertilizer plant.

PB84-131010/GAA PC **E12**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Second Draft of the UNIDO (United Nations Industrial Development Organization) Model Form of Semi-Turnkey Contract for the Construction of a Fertilizer Plant Including Guidelines and Technical Annexures.
19 Aug 83, 294p UNIDO/PC.74, R-83-59559

Keywords: *Industrial plants, *Fertilizers, *Contracts, Models, Agreements, Requirements, Developing country application.

The aim of the Guidelines is to inform, particularly the Purchasers in developing countries, of the conditions and obligations which they shall be entering into when choosing a particular Model Contract, and the safeguards and guarantees that should be sought accordingly in an actual negotiation. The Guidelines are presented in two parts: (i) the General Guidelines, giving the main features and obligations of the parties under the Contract, and (ii) Guidelines to specific Articles, explaining both the essential aspects of each Article and the reasoning behind key clauses in the most important Articles. The Semi-Turnkey Contract is basically a 'turnkey' contract for the supply of all the Plant and Equipment for the project, but with the Civil Engineering and Erection being undertaken by the PURCHASER or his sub-contractors.

PB84-131036/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
High-Level Expert Group Meetings Preparatory to the Fourth General Conference of UNIDO (United Nations Industrial Development Organization). International Forum on Technological Advances and Development, Tbilisi, USSR, 12-16 April 1983.
29 Apr 83, 49p UNIDO-ID/WG.389/6, R-83-55103

Keywords: *Technology assessment, Meetings, Genetics, Microelectronics, Materials, Petrochemistry, Energy.

The objectives of the Forum were: (1) To examine the potentials and limitations of selected technological advances for the industrial and economic development of the developing countries, in particular their industrial development; (2) To consider the implications of technological advances in their interaction with one another and their impact on industrial and other sectors; (3) To identify ways and means by which specific industrial and technological capabilities may be developed by the developing countries in order to be able to avail themselves of the benefits of the advances, where appropriate and feasible; (4) To identify policy actions to be taken by the governments of developing countries including ways of integrating policy responses to technological advances with their existing policy framework for industrial and technological development; (5) To identify the lines of international action and in particular action by UNIDO; and (6) To make suggestions and recommendations for consideration by the Fourth General Conference of UNIDO (UNIDO IV).

PB84-131044/GAA PC **E10**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Small-Scale Manufacture of Footwear.
Technical memo No.2.
c1982, 222p UNIDO/IS.354, R-82-34028

Keywords: *Footwear, *Industrial plants, Developing countries, Technology, Evaluation, Decision making, Benefit cost analysis, Developing country application.

The report covers (1) the footwear industry; (2) manufacturing technology; processing stages and equipment for six types of footwear; (3) project evaluation; (4) framework for national level decision making; economic implications, social aspects; cost benefit analysis.

PB84-131051/GAA PC **E07**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Water Use and Effluent Treatment Practices for the Manufacture of the 26 Priority Drugs in the UNIDO (United Nations Industrial Development Organization) Illustrative List,
R. W. Coughlin. 6 Jun 83, 134p UNIDO/IS.387, R-83-56924

Keywords: *Waste treatment, *Drugs, *Water pollution, Utilization, Industrial waste treatment, Drug industry, Packaging, Organic solvents, Materials recovery, Fermentation, Purification, *Waste water reuse, Developing country application, Beers.

The present report is concerned with treatment of wastes arising from the manufacture of these 26 drugs as well as standards and criteria for process water to be used in the manufacture of these drugs. Special procedures are required to prepare non-pyrogenic water and they are also discussed in this report. Special consideration is given in this report to waste beers from fermentation processes and to the very high strength wastes which can arise when organic solvents find their way into wastewaters. There is a separate section on recovering and purifying such solvents for re-use.

PB84-131069/GAA PC **E05**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Profile on Establishment of National Systems for Metal Scrap Collection and Processing,
P. Narancsik. 23 Jun 83, 99p UNIDO/IO.549, R-83-57590

Keywords: *Metals, Economic analysis, Utilization, Process charting, Performance evaluation, *Waste recycling, Solid wastes, Waste processing plants, Developing country application.

Final report on systematic metal scrap collection and recycling - covers (1) economic aspects and organizational aspects of a collecting and processing system; transport; criteria of scrap utilization, groupings, grading (2) iron and steel scraps classification, nonferrous metals (3) the scraps preparation factory; scrap suitable for direct consumption, choice of technology (4) pricing and profitability, quality control, specifications, storage of scraps; handling and conveying machinery (5) manpower needs, equipment costs, capital costs, power supply, etc. Diagrams, factory layout.

PB84-131077/GAA PC **E06**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Items which could be Included in Licensing Arrangements for the Transfer of Technology for the Formulation of Pharmaceutical Dosage Forms.
9 Jul 83, 114p UNIDO-ID/WG.393/3, R-83-58224

Keywords: *Drugs, *Contracts, Formulations, Licenses, *Technology transfer, Developing countries, Developing country application, World Health Organization, UNIDO.

This paper provides general guidelines and concrete drafting proposals for the negotiation and conclusion of licensing arrangements related to the formulation of pharmaceutical forms. These guidelines have general application to all those drugs contained in WHO's model list of essential drugs, including those on UNIDO's illustrative list. This document is intended to cover two main situations, on the assumption that the Licensee wishes to set up a new formulations unit, and requires the Licensor to provide the process know-how and basic engineering, and a situation where the Licensee already operates a plant for formulations and requires the Licensor to supply process know-how for new products.

PB84-131085/GAA PC **E06**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).

'Balanites Aegyptiaca' an Unutilized Raw Material Potential Ready for Agro-Industrial Exploitation,
I. M. Abu-Al-Futuh. 13 Apr 83, 114p UNIDO/IO.494, R-83-54325

Keywords: *Fruits, *Tropical regions, *Africa, Distribution(Property), Taxonomy, Chemical analysis, Amino acids, *Food processing, Oilseeds, Proteins, Fermentation, Ethanols, Oils, Soaps, Tropical regions, Marketing, Economic factors, Feeding stuffs, Developing country application, Underutilized species, Habitats.

In this study, the Balanites tree is described with special consideration to its characteristics, habitat geographical distribution, uses of its fruits and resources. The classification and vernacular names of Balanites aegyptiaca tree are also given. The composition of Balanites aegyptiaca fruit and chemical constituents of its various parts are given. The processing of Balanites fruit to separate the mesocarp, wooden shell and kernel is defined. The processing of Balanites fruit mesocarp for fermentation products (e.g. ethanol, carbon dioxide, ...) and steroidal sapogenins is outlined.

PB84-131093/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Contractual Arrangements for the Setting up of a Plant for the Production of Bulk Drugs or Intermediates.
9 Dec 82, 43p UNIDO-ID/WG.385/3, R-82-34752

Keywords: *Drugs, *Contracts, *Industrial Plants, Purchasing, Coordinated procurement, Contactors, Meetings, Manufacturing, Developing country application.

This document is primarily addressed to parties negotiating this type of agreements and in particular for enterprises in developing countries, which are able and willing to increase the range of bulk drugs (or intermediates) locally produced. Therefore, this report is on licensing agreements for the manufacture of bulk drugs and intermediates.

PB84-131275/GAA PC **E11**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Emerging Petrochemicals Technology: Implications for Developing Countries,
V. R. S. Arni. 29 Oct 82, 273p UNIDO/IS.350, R-82-33205

Keywords: *Chemical industry, *Industrial plants, Technology, Natural gas, Methyl alcohol, Hydrogen, Fuels, Economics, Forecasting, Syngas, Chemical feedstocks, Developing country application.

The objectives of this document are to identify: Major developments in petrochemical technology in the advanced countries; The major factors influencing technology change; The implications of technology ownership in relation to the mobility and transferability of technology; the opportunities that new technologies could afford to developing countries; Constraints, in access to such technology and the forms in which technology transfer can take place. A particularly important objective is to examine what forms of action developing countries, individually or collectively, may be able to take to influence the evolution of technology so as to make it viable to their needs in both economic and strategic terms.

PB84-131382/GAA PC **E06**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Items which could be Included in Contractual Arrangements for the Setting up of a Plant for the Production of Bulk Drugs (or Intermediates) Included in UNIDO (United Nations Industrial Development Organization) Illustrative List.
14 Jul 83, 125p UNIDO-ID/WG.393/4, R-83-58484

Keywords: *Industrial plants, *Drugs, *Contracts, Production, Manufacturing, Industrial engineering, Plant layout, Developing country application.

The report provides guidance for the negotiation and drafting of engineering contracts for setting up a plant for the production of bulk pharmaceuticals and/or intermediates for the addition or adaptation of a factory in operation when new products or new technologies are introduced.

PB84-131556/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Manual on Jigs for the Furniture Industry,
P. J. Paavola, and K. Ilonen. 1981, 71p UNIDO-ID/265, R-81-30086
Errata sheet inserted.

Keywords: *Furniture, *Industrial development, *Woodworking, Requirements, Design, Tools, Woodworking, Developing countries, Developing country application.

The report gives information designed to familiarize technical personnel of small furniture plants in developing countries with basic requirements in design of jigs and gives some examples of jigs for use on woodworking machinery and covers economic and technical aspects of jig design and storage and gives examples of jigs for use in machining of furniture parts and in assembling.

PB84-131564/GAA PC **E08**/MF **E01**
National Inst. for Occupational Safety and Health, Morgantown, WV. Div. of Safety Research.
Selected Bibliography on Hazardous Materials Control,
R. Ronk, M. K. White, K. Mull, and H. Linn. Oct 83, 174p*

Keywords: *Environmental surveys, Exposure, Toxicity, Inspection, *Toxic substances, *Occupational safety and health, Listings.

The increasing use, handling and disposition of hazardous materials are giving rise to unique health and safety problems, especially for those workers occupationally exposed to such materials. Interagency efforts by NIOSH, OSHA, the USCG, and EPA are underway to establish effective guidelines for 'the protection of workers who investigate and clean up hazardous waste sites and respond to hazardous substance emergencies.' An early stage of program development has been the search of past and current literature for sources of information pertinent to hazardous materials control in general, and to the specific area chosen by NIOSH for initial concentration: personal protective equipment. Herein is a selected listing of literature related to hazardous materials control and personal protective equipment. The bibliography is intended as basis for further NIOSH research and documentation, and is offered for similar use by others in the private and public sectors.

PB84-131572/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Economic Production of Doors and Windows,
I. R. Traversa. 2 Sep 83, 56p UNIDO-ID/WG.369/8, R-83-61642

Keywords: *Houses, *Construction, *Machine tools, Automation, Machining, Production planning, Developing country application.

The report covers (1) definition of components and of basic machining operations (2) hydraulically operated hot and cold platen presses (3) manufacturing methods; traditional or basic machinery (4) window production employing automatic machines (5) door casement and flush door construction (6) outlines of a medium-sized doors and windows factory.

PB84-131598/GAA PC **E07**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Production of Newsprint from Waste Paper in North America,
T. Jeyasingam. 18 Nov 82, 127p UNIDO/IO.500/Rev.1, R-82-34129

Keywords: *Waste disposal, *Paper industry, *Waste recycling, Cost analysis, Technology, Paper industry, Developing country application, Waste recycling, Waste utilization, Deinking, Listings.

Contents:
Introduction;
Reports on visits to deinking operations in U.S.A. and Canada;
Typical deinking systems in U.S.A. and Canada;
An appropriate deinking technology for developing countries to produce newsprint;
List of U.S. patents related to deinking;
List of newsprint mills with deinked pulp in U.S.A. and Canada;
List of newsprint mills working with deinked pulp in other parts of the world;
Index of abbreviations;
Persons with whom discussions were held and those who directly as well as indirectly provided assistance for this study.

PB84-131614/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Plastics in the Building and Construction Industry,
J. R. Crowder. 3 Mar 83, 19p UNIDO-ID/WG.392/4, R-83-53180

Keywords: *Plastics, *Construction, *Building materials, Chemical properties, Physical properties, Developing country application, Listings.

Plastics have a unique range of properties that fit them for numerous applications in building, but also impose some limitations on them. Applications of plastics cover most areas of building and are discussed in terms of structures, secondary elements and services, which are their most important field of use. Although there are some limitations on the use of plastics, there are a number of ways in which they might be used more effectively and some suggestion is offered on how this might be achieved.

PB84-131622/GAA PC **E07**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Preparatory Phase in the Establishment of a Regional Project in the Area of Maintenance and Repair in Latin American and Caribbean Sugar Mills.
1983, 148p UNIDO/IO.531, R-83-52764

Keywords: *Industrial development, *Sugar, *Latin America, Maintenance, Refineries, Specialized training, Technology innovation, Developing country application.

The report regarding preparation of a project of assistance of maintenance and repair for sugar industry in the Latin American region covers (1) existing facilities and systems in Bolivia, Peru, Colombia, Panama, Nicaragua, Mexico, Jamaica, Barbados, Guyana, Trinidad and Tobago, Costa Rica, Cuba; (2) regional project to introduce modern technology, training of technical personnel, organization of a regional information system; (3) research cooperation, institutional framework, technical assistance needs, project design.

PB84-131739/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Medical Applications of Plastics,
G. W. Hastings. 1983, 15p UNIDO-ID/WG.392/2, R-83-53178

Keywords: *Prosthetics, *Plastics, *Health, Materials, Toxicity, Prostheses, Orthoses, Contact lenses, Artificial eyes, Developing country application, Biomaterials, Product safety.

The attraction of plastics materials for biomedical uses lies in the diversity of types and properties available. In theory it should be possible to tailor the material used to each particular application, but in general it is not either because other important properties are sacrificed or for economic reasons. In practice, certain materials have become prominent in use because they are completely satisfactory or because they offer the most acceptable compromise. Satisfactory as a judgement on a material will include consideration of end-use properties and user acceptance, processability including sterilization where necessary and availability at an acceptable cost.

PB84-131754/GAA PC **E06**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).

Medicinal and Aromatic Plants for Industrial Development. A Review of UNIDO Activities on the Utilization of Medicinal and Aromatic Plants for the Production of Pharmaceuticals in Developing Countries,
A. Tcheknavorian-Asenbauer, and R. O. B.
Wijesekera. 3 Jun 82, 108p UNIDO/IO.505, R-82-27167

Keywords: *Drugs, *Plants(Botany), *Asia, *Africa, *Medicinal plants, Lesser developed countries.

Contents: Interest of international bodies; Unido programmes--general; The exploratory missions by the UNIDO mobile unit for the pharmaceutical and essential oils industry in the LDCs of Asia and Africa; Work of the mobile unit in the least developed countries of Asia; Work of the mobile unit in the LDCs of Africa; Other ongoing UNIDO programmes in prospect and retrospect; Programme for development of medicinal and aromatic plant products in the Arab states; Workshops and training programmes; Some considerations in the development of plant-derived drugs, with particular regard to the needs of developing countries.

PB84-131762/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Importance of Blood as a Basic Material for Local Production of Blood Derivatives Essential for the Health Care Programmes of Developing Countries,
C. Chari, and A. Tcheknavorian-Asenbauer. 1983,
32p UNIDO/IO.525, R-83-50024

Keywords: *Health, Developing country application.

The use of blood components in recent years has enabled the clinicians to treat patients with the specific component which they lacked and also facilitated the most economic use of blood so that a single donation can be used to treat patients suffering from a variety of conditions. The component therapy also yields excess blood plasma which can be fractionated into still more therapeutic, prophylatic, diagnostic and quality control material.

PB84-131770/GAA PC **E06**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Industrial Production of Coconut Cream: The Production Concept,
D. Adair, and A. Marter. 7 Dec 82, 105p UNIDO/
IO.528, R-83-50135

Keywords: *Industrial plants, *Coconuts, Manufacturing, Fuels, Shells, Cost analysis, Marketing, Process charting, Performance evaluation, Equipment, Consumer products, Solid wastes, Developing country application, Coconut.

The document contains a detailed review and evaluation of existing coconut cream production activities and in conclusion identifies the optimum factory based production technology supported by relevant financial and economic considerations.

PB84-131838/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Implications of New Materials and Technology for Developing Countries.
17 Mar 83, 16p UNIDO-ID/WG.384/1/Rev.1, R-83-53553

Keywords: *Natural resources, *Economic development, Resources, Policies, Developing country application.

The report covers (1) current and anticipated new materials and advanced technology; material shortages; energy implications; need for energy saving and recycling; metals, plastics, composites (2) need for analysis by DCs; economic implications; indicated action.

PB84-131846/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Implications of Biomass Energy Technology for Developing Countries.
7 Mar 83, 23p UNIDO-ID/WG.384/6/Rev.1, R-83-53160

Keywords: *Biomass, *Energy source development, Technology, Pyrolysis, *Gasification, Liquefaction, Ethyl alcohol, Methyl alcohol, Methane, Renewable energy source, Developing country application.

Contents:
- Current biomass energy production and conversion technologies;
- Policy implications for developing countries;
- Options for international action.

PB84-131861/GAA PC **E08**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Mini Hydro Power Stations. (A Manual for Decision Makers).
1981, 173p UNIDO/IS.225, R-81-24534

Keywords: *Hydroelectric power, *Technology assessment, Management planning, Maintenance management, Structural members, Cost analysis, Developing country application.

The report gives guidance for decision making in this field at national level, local level or at the planning and project implementation levels; covers (a) comparison of MHG with alternative energy sources, including thermal and renewable energys (b) development of MHG: programming; evaluation of resources and demand; preinvestment studys; financing; construction and start-up; operation and maintenance and repair; training, (c) choice of technology; equipment, adaptation, (d) approaches to specific projects; costs, (e) international cooperation. Statistics, bibliography, diagrams.

PB84-131879/GAA MF**$4.75**
Intermediate Technology Publications Ltd., London (England).
Small-Scale Production of Cementitious Materials,
R. J. S. Spence. c1980, 55p ISBN-0-903031-612
Microfiche copy only.

Keywords: *Industrial plants, *Cement, Raw materials, Calcium oxides, Lime cements, Pozzolans, Production, Cost analysis, Developing country application.

This report begins with a discussion of the place of cement in development and existing cement-production technology. The second part on small scale Portland cement plants covers Indian development work on small scale vertical shaft kilns, medium scale vertical shaft kilns, the compact cement plant, cement production in the People's Republic of China, economic considerations of small and large plants, and a comparison of the Indian and Chinese experiences. The third section on lime-based cementing materials covers the raw materials, production process, capital costs, labor intensity, and production costs of lime production, the raw materials, processing and uses of pozzolanas, economics of pozzolana and lime-pozzolana production, and the comparative economics of lime-pozzolana production and Portland cement production. The fourth part on other cementing materials includes hydraulic lime and natural cement, gypsum, and other cement making processes. Non-technical problems in implementing appropriate technologies are also covered.

PB84-131887/GAA MF**$4.75**
Intermediate Technology Development Group, London (England).
Picking Up the Threads: Small Firms in the Wool Textile Industry.
Alternative industrial framework rept. no. 4,
A. E. Bollard. c1982, 43p
Microfiche copy only.

Keywords: *Fibers, *Textile industry, *Great Britain, Woolen textiles, Competition, Synthetic fibers, Government policies, Developing country application.

The British reclaimed wool industry was hard hit by competition from synthetic fibers. This report outlines the industries' response. It covers the wool textile industry in the United Kingdom including firms in the industry; stages of production (fleece preparation, fibre reclamation, yarn preparation, weaving, finishing), types of fabrics (worsteds, woolens, low cost woolens), industrial organization, craft production, and Harris Tweed - a case study. The second part on technology and labor covers machinery development, equipment makers, the workforce, and men versus machines. Part three on competition to UK wool textiles covers the threat from synthetics, foreign competition, the Prato Wool Industry in Italy - a case study, relative UK Competitivity, the wool trade and government policy, and other competition-prone industries. Part four on the role of the smaller wood mills covers size and efficiency, economies of small scale production and administration, and new roles for wool and mills.

PB84-131895/GAA MF**$4.75**
Intermediate Technology Development Group, London (England).
Industrial Employment through Appropriate Technology.
Occasional papers no. 6,
A. Bollard. c1983, 33p
Microfiche copy only.

Keywords: *Industrial development, *Employment, Government policies, Manufacturing, Economic development, Productivity, Developing country application.

This paper outlines the role that appropriate technology can play in employment generation in the industrialized West. It is illustrated with examples of technologies already in industrial operation and the policies designed to support them. Chapter titles are: What is appropriate technology; technology development in the west; a policy of employment generation; when is a technology appropriate; some appropriate technologies in industry; energy and resource conservation; organizations for employment generation; appropriate support systems; and impact of appropriate technology on employment creation.

PB84-131903/GAA MF**$4.75**
Intermediate Technology Development Group, London (England).
Planning for Rural Industrialization: A Review of Developing Country Programmes.
Occasional papers no. 8,
S. Sinha. c1983, 69p
Microfiche copy only.

Keywords: *Industrial development, Rural areas, Policies, *Agricultural economics, Productivity, Developing country application.

This study on rural industrialization has chapters on: The Economic Environment faced by the Rural Entrepreneur; Planning for Rural Industrialization; Policy Measures for Rural Industrialization; Institutional Arrangements for the Implementation of Rural Industry Programs; The Efficacy of Rural Industry Programs; and an Annex showing how a Rural Industry Promotion program worked in India. The report concludes that a mix of policies is required for effective action; political and economic commitment are essential; political systems affect the activity by allowing or restricting individual sovereignty; and special considerations must be taken into account, such as the dependence of the local economy on a neighboring one.

PB84-131911/GAA MF**$4.75**
Intermediate Technology Development Group, London (England).
Driving a Bargain: Small Repair and Servicing Garages.
Alternative industrial framework rept. no. 6,
A. E. Bollard. c1983, 45p
Microfiche copy only.

Keywords: *Great Britain, Services, *Motor vehicles, *Maintenance, Consumers, Productivity, Developing country application.

This report studies the advantages of small garages for service. They can't compete with the larger petrol selling stations, but they can offer better service. Overall they hold the crucial advantages of being flexible and having low overheads. These are reflected in the much lower hourly rates charged by small garages. Minimum efficient scale in this industry is tiny, and the trade still remains relatively open to new entrants.

PB84-131937/GAA MF**$4.75**
Intermediate Technology Publications Ltd., London (England).

Small Scale Foundries for Developing Countries: A Guide to Process Selection,
J. D. Harper. c1981, 73p ISBN-9-903031-78-7
Microfiche copy only.

Keywords: *Foundries, *Castings, Moulding, Foundry practice, Selection, Developing country application.

This book is not intended as a textbook of foundry practice. The purpose is rather to assist anyone about to start or to expand a small scale foundry to consider the various available processes, and to select the most appropriate for the circumstances. An indication is given of the type of raw materials and equipment which will be needed, and the degree of training or skill which is likely to be required.

PB84-131945/GAA MF**$4.75**
Intermediate Technology Publications Ltd., London (England).
Office Management for Co-operatives,
J. Launder. c1980, 104p ISBN-0-903031-73-6
Microfiche copy only.

Keywords: *Cooperatives, *Management training, Instructional materials, Personnel, Records management, Great Britain, Developing country application.

This book shows that offices and paperwork are important because they exist to provide services to managers, that these managers need the services of a good office to run their cooperative effectively. The book is in six parts. Part 1 introduces the principles of office management. Part 2 looks at essentials of a small office. Parts 3 & 4 consider the subjects of staffing and controls in medium size offices. Parts 5 & 6 are concerned with the details of records, correspondence, equipment, and accommodation. Accounting and bookkeeping are not included.

PB84-131952/GAA MF**$4.75**
Intermediate Technology Development Group, London (England).
Brick Work: Small Plants in the Brick Industry.
Alternative industrial framework rept. no 3,
A. E. Bollard. c1982, 46p
Microfiche copy only.

Keywords: *Industrial development, *Great Britain, *Bricks, Technology, Productivity, Personnel, Energy, Manufacturing, Developing country application.

The report contains four parts. The first part describes the brick industry in the United Kingdom including an introduction and history, bricks and their market, industrial structure, the smaller brick plant today, and European comparisons. The second part on the brick making process includes stages of production and choice of technique (clay winning, brick forming, and brick firing); development of technology; patterns of work; and men machines, productivity, and scale. The third part is on energy use in brick making and includes energy in production, energy in transport, the response of brickmakers to the energy crisis, scale of energy and other factor use, and other energy intensive industries. The fourth part is on the question of size and includes economies of scale in production, transport, marketing, and management, and discusses the most appropriate plant size.

PB84-131960/GAA MF**$4.75**
Intermediate Technology Development Group, London (England).
Remoulding the Future: The Plastics and Other Recycling Industries,
Alternative Industrial Framework Report No. 5,
A. E. Bollard, and J. A. Vogler. c1982, 48p*

Keywords: *Industrial wastes, Reclamation, Materials recovery, Plastics industry, Metals, Papers, Glass, Textiles, Recirculation, Chemical compounds, *Waste recycling, Plastics recycling, Solid wastes, Developing county application, Liquid wastes.

This report is a comprehensive study of recycling industries in the United Kingdom. It discusses different types of recycling including the reuse of the object, reuse of the material, reclamation of the material and conversion of the material. The materials discussed are ferrous and nonferrous metals, paper, glass, textiles, chemicals, and other organic and inorganic wastes. The recycling operation is detailed including collection, separation, processing, and fabricating. Private industry, government, and voluntary organization activities are considered as is the promotion and implications of increased recycling. Part two of this report studies the relatively new and rapidly growing plastics recycling industry. It covers using process wastes and post-consumer wastes as material, the pressures to recycle, recycling operations (collection separation, reprocessing, marketing, and mixed plastics wastes), and the organization of the plastics recycling industry in private, public, and voluntary organizations. (Copyright (c) Intermediate Technology Development Group, 1982.)

PB84-131986/GAA PC **E12**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Guidelines for the Establishment of Industrial Joint Ventures in Developing Countries,
V. R. S. Arni. 10 Dec 82, 290p UNIDO/IS.361, R-82-34762

Keywords: *Economic development, *Industrial development, *Financial management, Industries, Businesses, Investments, Financing, Risk, Developing country application.

The report covers joint venture in national perspective and in promotor's perspective; developing country government intervention; options of the national entrepreneur; the joint-venture concept project selection and technology section seeking joint-venture partnership; linkages between capital, management and technology incorporation of a company and its international guidelines negotiating (a) management and control in a joint-venture company (b) the capital structure (c) knowhow and technology transfer joint-venture contracting.

PB84-132000/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Promoting the Use of Wood in Construction,
M. Tejada. 25 May 83, 54p UNIDO-ID/WG.395/2, R-83-56338

Keywords: *Wood, *Building materials, *Construction, Structural design, Technology assessment, Cost analysis, Prefabrication, Construction, Developing country application.

The report covers need for housing in Andean Group countries; advantages of wood over imported concrete; need for technical information or use of tropical timber, on wood processing and quality standards; engineering design; appropriate legislation; market; use of wood in official housing projects, construction of prototypes; prefabricated building as a means to reduce costs and promote wood products as building materials; training, technical assistance, cooperation; and experiments, equipment, drying.

PB84-132034/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Measures to Promote the Use of Wood and Wood Products.
Issue paper No.2.
20 Jun 83, 19p UNIDO-ID/WG.395/8, R-83-57376

Keywords: *Wood products, *Marketing, *Wood, Classifications, Structural timber, Wood products, Developing country application.

The report covers (1) consumption of wood products; (2) the development of domestic markets; (3) the promotion of wood in construction industry; (4) promotion of commercially less accepted trees species; (5) trade promotion measures including marketing.

PB84-132042/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Plastics in Agricultural Applications in Developing Countries,
A. D. Clarke. 3 Mar 83, 35p UNIDO-ID/WG.392/3, R-83-53179

Keywords: *Plastics, *Agriculture, *Food storage, Utilization, Polymeric films, Developing country application.

The use of plastics in agricultural applications represents a positive growth market for the plastics industry, particularly in developing countries. A mechanism for achieving the necessary transfer of technology to the ultimate user, the farmer and grower, is outlined and this is considered as an essential key to effective market penetration. A number of selected uses of plastics in agricultural applications in developing countries are described, including their use in growing, water conservation and produce storage. The use and development of plastics film as a 'mulch' (a covering of the soil) are described indicating how this very simple but performance effective material product can be altered to meet the varying environmental and economic conditions unique to each country.

PB84-132059/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Application of Wind Power in the Shipbuilding (Use of Sail in the Marine Transportation),
D. C. Anderson, III. 4 Feb 83, 25p UNIDO-ID/WG.375/40, R-83-51155

Keywords: *Meteorology, *Wind energy, *Ships, Marine surface propulsion, Wind(Meteorology), Technology assessment, Developing country application.

The report covers revival of sails under the impact of increased oil fuel costs, advantages of using free wind energy, especially in vessels up to 5000 dwt, choice of technology, sails supplementing engines, experimentation with completely traditional sails, sea transport, sailboat start-up operations in the Caribbean area, recent experience with sails and engineering design.

PB84-132067/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Packaging and Plastics,
D. A. Dean. 8 Mar 83, 45p UNIDO-ID/WG.392/1, R-83-53177

Keywords: *Plastics, *Packaging, Storage, Performance evaluation, Polymeric films, Environmental impacts, Consumer products, Developing country application.

The introduction indicated a number of ways plastic and packaging could be considered. These have only been covered on a very broad basis in this paper. Each of the many aspects touched upon could be expanded into a topic which, when discussed in detail, could form a conference in its own right. The role of plastics in packaging is already a success story and will continue to increasingly dominate the packaging scene. The environmental issues are being closely studied and will ultimately be solved by common sense and logic.

PB84-132083/GAA PC **E05**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Information Sources on the Pesticides Industry.
UNIDO Guides to information sources No.10.
1982, 94p UNIDO-ID/280

Keywords: *Information sources, *Pesticides, Industries, Sources, Developing countries, Global, Developing country application.

The directories and guides present sources considered to be of practical value to users. The data have been compiled so as to facilitate rapid access to the bodies referred to and the acquisition of the publications listed. Pesticides are important agricultural inputs for developing countries, especially for protecting the investment made in introducing new varieties of high-yielding crops and in water resources and fertilizers. The formulation of pesticides, a relatively simple process, requires only a modest capital investment and provides a highly beneficial way of exploiting local raw materials, such as clays and other mineral carriers. Savings in foreign exchange and transportation costs up to 50 per cent can be achieved by formulating pesticides locally. UNIDO assists developing countries in setting up facilities for the formulation and distribution of pesticides.

PB84-132091/GAA PC **E06**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).

Information Sources on Grain Processing and Storage.
UNIDO Guides to information sources No.40.
1982, 113p UNIDO-ID/283

Keywords: *Grains(Food), *Food processing, *Food storage, Grain crops, Grain elevators, Food processing, Developing countries, Global, Developing country application.

The grain processing and storage industry is one of the most important branches of the food industry. Efficient post-harvest conservation and storage techniques not only provide more food for more people but also improve the nutritive value of the grain and contribute to the development of a sounder national economy by stimulating production. Applied research is needed to adapt available technologies to the specific needs of particular areas and to develop low-cost drying, threshing and storage equipment suited to local conditions and practices.

PB84-132109/GAA PC **E09**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Wood Resources and Their Use as Raw Material. Sectorial Studies Series Number 3,
M. de Baker, and J. S. Bethel. 1983, 189p UNIDO/IS.399
Prepared in cooperation with the Food and Agriculture Organization of the United Nations, New York.

Keywords: *Management techniques, *Wood, *Forestry, Developing countries, Inventories, Forest land, Area, Wood products, Utilization, Structural timber, Harvesting, Management, Lumbering, Transportation, Veneers, Plywood, Particle boards, Production, International trade, Marketing, Developing country application, Global.

A new forest resource assessment was recently completed for all tropical forests by FAO through a FAO/UNEP project. A perusual of selected information from this world-wide data bank on forest reserves, which has some limitations, provides information as to the present state of the world's forest cover and its utilization and contribution to society. This paper, while reviewing the forest resources available in the world today, aims to provide some insight into the industrial development potential of these resources and into the constraints that up to now have impeded their full utilization.

PB84-132117/GAA PC **A03**/MF **A01**
Economic Research Service, Washington, DC.
High-Yielding Varieties of Rice in the Philippines: Progress of the Seed-Fertilizer Revolution.
Foreign agricultural economic rept.,
L. J. Atkinson, and D. E. Kunkel. Feb 76, 44p FAER-113
Prepared in cooperation with Philippines Dept. of Agriculture, Manila.

Keywords: *Rice, *Agricultural economics, *Philippines, Yield, Production, Field tests, Irrigation, Fertilizers, Comparison, Regression analysis.

About half the lowland rice area in the Philippines was planted to highyielding varieties (HYV's) in crop year 1969/70. The national average yield for all farmers was 1.7 metric tons per hectare. Yields average 20 percent higher for HYV's than for other varieties in the irrigated area and about 10 percent higher in the nonirrigated lowlands. However, one-fifth of the farmers growing HYV's in the irrigated area obtained high yields of more than 3.3 metric tons per hectare, averaging 4.3 tons per hectare.

PB84-132141/GAA PC **E04**/MF **E01**
Sydney Univ. (Australia). School of Civil and Mining Engineering.
Behaviour of Foundations Supported by Clay Stabilised by Stone Columns.
Research rept.,
N. P. Balaam, and H. G. Poulos. Nov 82, 35p R-424

Keywords: *Soils, Pile foundations, Stone, Settlement(Structural), Clays, Consolidation, Soil stabilization, Finite element analysis.

Despite the widespread use of stone columns, present design methods are largely based on empirical data or simplified concepts of the action of the columns. In this report solutions are presented which provide a basis for more rational design methods. A finite element loading path method is briefly described which enables the load-settlement response of a single isolated stone column to be computed. This method of analysis is used to reproduce the results from a previously published field loading test. An examination is then made of the behavior of clay stabilized by large numbers of stone columns installed in a regular array over an extensive area. An analytical solution is presented for estimating the settlement of a clay layer reinforced by fully penetrating stone columns and loaded by a rigid raft.

PB84-132166/GAA PC **E04**/MF **E01**
Sydney Univ. (Australia). School of Civil and Mining Engineering.
Effects of Ground Creep on a Lining Installed in a Circular Tunnel.
Research rept.,
J. P. Carter, and J. R. Booker. Apr 83, 55p R-439

Keywords: *Tunneling, *Soils, Creep properties, Elastic properties, Cylindrical bodies, Loads(Forces), Stress analysis, Stiffness methods.

The analysis of the interaction between a thin, circular, elastic tunnel lining and the surrounding visco-elastic ground has been studied. In strong ground, such as rock, it is usual for the lining to be installed after the tunnel has been excavated and if the rock subsequently creeps then loads will be induced in the lining. The magnitude of these loads will depend on the creep properties of the rock, the elastic properties of the lining, the time after excavation at which the lining is installed as well as upon the initial stress state of the ground. A parametric study has been carried out to investigate these effects.

PB84-132190/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Value Analysis in the Furniture Industry,
A. Juva. 1983, 74p UNIDO-ID.298

Keywords: *Furniture, *Industrial plants, Product development, *Wood products, Developing country application.

This manual introduces the technique of value analysis and its application in the furniture industry. The technique was developed in the United States of America for the metal industry, but it is applicable in the furniture industry, too. The furniture industry has a wide range of raw materials and work methods from which to choose. Value analysis can be applied to many activities other than product development - such as development of operations, methods and organizations. However, it is used mostly for product development (90 per cent), where concrete results can be seen and measured in terms of money.

PB84-132349/GAA PC **E05**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Prospects for Production of Vaccines and Other Immunizing Agents in Developing Countries.
Sectoral studies series No. 4.
17 Aug 83, 90p UNIDO/IS.402, R-83-59451

Keywords: *Vaccines, *Health, Production, Immunization, Developing country application.

The study has been prepared by UNIDO's Division for Industrial Studies, Sectoral Studies Branch, with the aim of drawing attention to the urgent need for a new approach to the problems of production of vaccines and other immunizing agents in developing countries. This area has been studied both for its great potential social benefits for developing countries and because of its inherent possibilities to play a role in an industrialization strategy based on more self-reliance.

PB84-132828/GAA PC **A03**/MF **A01**
Comision Nacional de Investigacion Cientifica y Tecnologica de Chile, Santiago.
Uso de Microcomputadoras en Sistemas de Informacion: La Experiencia de CONICYT (Use of Microcomputers in Information Systems: The Experience of CONICYT),
E. M. Molina. 1983, 38p
Text in Spanish, abstract in English.

Keywords: *Computers, *Information systems, Library science, Information retrieval, Data base management, Developing country application.

This document contains the experiences of CONICYT in the use of microcomputers for the establishment and exploitation of systems and services of bibliographic, documental, and statistical information in science and technology. It describes information systems such as the Data Base of Current Research Projects at the National Level and the Project Evaluation System. The report covers problems, the hardware used, the software developed, and future projections. It also describes other information systems encountered or studies such as the Automization of the National Collective Catalog of Periodicals and the Data Base on National Scientific and Technical Activity. The report explains the national situation in teleinformatics, exploitation of national and international data bases, and access at distance to documents and projects of CONICYT.

PB84-132919/GAA PC **E05**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Industrial Processing of Natural Resources.
1981, 87p UNIDO-ID/261

Keywords: *Industrial plants, *Industrial development, *International trade, *Natural resources, Manufacturing, International trade, Exports, Government policies, Developing country application.

The report covers (1) resource-based industrialization: concepts and trends; progress made in diversification of exports cut of unprocessed raw materials; (2) determinants of the location of industry for processing; technological change; economic aspects; transport economics; tariffs, trade barriers; transnational corporations; (3) aluminium, copper, iron and steel, lead, nickel, tin, zinc; (4) a framework for analysing location; (5) government policy formulation; options.

PB84-133099/GAA PC **A25**/MF **A01**
Subtropical Plants and Olive Trees Inst. of Chania (Greece).
Proceedings of the IIId International Congress on the Biological Value of Olive Oil Held at Chania, Greece on September 8-12, 1980 (Actes du IIIe Congres International sur la Valeur Biologique de l' Huile d' Olive).
Sep 80, 595p
Text in French, Greek and English. Sponsored in part by International Olive Oil Council.

Keywords: *Oilseed crops, *Health, Lipids, Blood chemical analysis, Cholesterol, Arteriosclerosis, Nutritive value, Metabolism, Developing country application.

This report includes reports on: The biological and medical aspects of olive oil; serum-lipid studies and cholesterol studies of olive oil; arteriosclerosis and lipid metabolism related to olvie oil; olive oil in digestive pathology; the role of lipids in bone and brain growth; olive oil in the preparation of foodstuffs; the biological value of table olives; and olive oil's qualitative characteristics and factors affecting same.

PB84-133255/GAA PC **A11**/MF **A01**
National Heart, Lung, and Blood Inst., Bethesda, MD.
Foods for Health: Report of the Pilot Program.
Final rept.
Aug 83, 228p NIH/PUB-83-2036, NHLBI-79-305
Prepared in cooperation with Giant Food, Inc., Washington, DC.

Keywords: *Nutrition, *Food, Evaluation, Feasibility studies, Marketing, *Health education.

This project evaluated the impact of the year-long nutrition education program emphasizing heart health sponsored jointly by the NHLBI and Giant Food, Inc. The feasibility of such a program was established. Both the 'point of purchase' and marketing strategies for nutrition education were appealing to consumers, food retailers, and other private sector interests. An assessment of the program showed that its effects on consumer awareness, knowledge, and behavior were mixed. Telephone surveys indicated that, over time, study participants showed substantially greater awareness and knowledge of the fat and cholesterol contents of foods and the relationship between dietary fat and serum cholesterol than selected comparison respondents. However, consumer food habits showed little change when measured either by actual food sales data or reported changes in food selection.

PB84-133305/GAA PC **A99**/MF **A01**
Michigan State Univ., East Lansing.
Systems Approach to Agricultural Sector Development Decision-Making: Building and Institutionalizing an Investigative Capacity,
G. E. Rossmiller. 1977, 629p AID-PN-AAJ-941
Contract AID-csd-2975

Keywords: *Economic development, *Agricultural economics, Systems analysis, Mathematical models, Decision making, Computerized simulation, Government policies, Sociometrics, Populations, Korea, Technology transfer, Allocations, Water supply, *Grains(Food), Prices, Market value, Income, Developing country application, Institutionalization.

Complex socioeconomic linkages and interdependencies within and between nations have made planning and policy determinations for agricultural development increasingly difficult. This four-part report, written for agricultural decisionmakers, policy analysts, and students of systems approach and economic development, explains a simulation approach for policy decisionmaking in agriculture. An introductory section presents a conceptual model of system simulation in which agricultural decisionmaking is approached from both an investigative side and an administrative side. Also presented in this section are discussions of the interaction of agriculture and the national economy. The second section addresses the institutionalization of this model within the Ministry of Agriculture and Fisheries in the Republic of Korea. The third part consists of two Korean sub-sector models for a grain management program and for a government analysis of food grain pricing. Finally, future directions for the model, including its transferability and the development potential of the simulation approach, are discussed.

PB84-133321/GAA PC **A16**/MF **A01**
Center on Technology and Society, Cambridge, MA.
Trading with the Third World and Promoting Awareness of Development Issues: Experiences of Alternative Marketing Organizations in Europe and the United States.
Final rept.,
J. R. Beardsley. 30 Oct 81, 360p AID-PN-AAK-118
Contract AID/otr-C-1805
Prepared in cooperation with New TransCentury Foundation, Washington, DC.Portions of this document are not fully legible.

Keywords: *International trade, *Education, Commodities, *Food, Marketing, United States, Europe, Developing country application, Handicrafts, Case studies.

Alternative marketing organizations (AMO's) are trading and educational organizations which seek to help developing countries by importing their handicrafts and food commodities and by designing educational programs on Third World conditions and international trade and development. This report describes and assesses the performance of AMO's both in Europe and the United States. Appended are 27 AMO case studies, summaries of A.I.D. export development projects, a survey of the experience of U.S. private voluntary organizations (PVO's) in export marketing along with recommendations for future PVO involvement, and a 35-item bibliography (1966-80).

PB84-133867/GAA PC **A03**/MF **A01**
Tribhuvan Univ., Kathmandu (Nepal). Research Centre for Applied Science and Technology.
Study on Vegetable Tannin in Nepal,
A. Kattel. May 82, 44p

Keywords: *Nepal, *Leather, Industries, Technology, Processing.

This report focuses on the growing demand for tannin in Nepal as a result of the establishment of various leather industries and the possible import substitution by indigenously produced vegetable tannin. It includes the list as well as relevant notes on some of the important tannin bearing plants of Nepal. Further, the results of tannin extraction from some of these plant materials as well as preliminary results on the techno-economic feasibility of the process are also presented. The report also contains an account of the traditional methods of leather processing still in practice in the remote rural areas of Nepal.

PB84-134055/GAA PC **A16**/MF **A01**
Metrotec, Inc., Washington, DC.
Women and Drugs. Research Issues Number 31,
T. J. Glynn, H. W. Pearson, and M. Sayers. 1983, 363p* DHHS/PUB/ADM-83-1268
Contract PHS-HRA-271-80-3720

Keywords: *Drugs, Research, Hallucinogenic drugs, Social psychology, Physiological effects, Humans, Narcotics, Indexes(Documentation), *Women, Literature survey.

The goal of this volume is to provide researchers with an up-to-date survey of the literature concerning women and drugs. This is the second volume in the Research Issue Series dealing with the subject of drug use by women. The first volume, Drugs and Pregnancy, edited by Ferguson, Lennox, and Lettieri and published in 1975, was the fifth issue in the series. That volume explored the literature in an area that, up to that time, had probably received more attention than any other in the study of women's drug use. This volume, representing the direction this field has taken, significantly expands the range of studies from that of the earlier volume. The abstracts included here are intended to be faithful representations of the original studies, conveying what was done, why it was done, what methodology was employed, what results were found, and what conclusions were derived from the results.

PB84-134105/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Effects of Corruption on Administrative Performance: Illustrations from Developing Countries.
World Bank Staff working paper,
D. J. Gould, and J. A. Amaro-Reyes. c1983, 55p
ISBN-0-8213-0259-0, WP-580
Also pub. as International Bank for Reconstruction and Development, Washington, DC. Management and Development Series no. 7.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Social services, *Ethics, Policies, Performance evaluation, Economic development, Behavior, Crimes.

Corruption's widespread occurrence in developing countries has raised substantial concern. Developing countries' particular circumstances--rapid economic and social change, strong kinship and ethnic ties, new institutions, overlapping and sometimes conflicting views about what is proper public behavior--appear to contribute to corruption's saliency. According to much of the data examined covering countries in Asia, Africa, and Latin America, corruption has a deleterious, often devastating, effect on administrative performance and economic and political development, for example, corroding public confidence, perverting institutions' processes and even goals, favoring the privileged and powerful few, and stimulating illegal capital export or use of nonrational criteria in public decisions. Corruption counteraction measures may range from commissions of inquiry, ombudsmen to investigate citizen complaints, courses and seminars, to simplification of administrative and financial procedures. However, their success will depend on the gradual creation of a political and public climate favoring impartiality and on the wisdom of specific governmental actions. (Copyright (c) 1983 The World Bank.)

PB84-134360/GAA PC **A05**/MF **A01**
Georgia Univ., Athens. Inst. of Ecology.
Environmental Profile of Guatemala: Assessment of Environmental Problems and Short and Long-Term Strategies for Problem Solution,
J. L. Cooley, E. Farnworth, D. Hoy, and C. Jordan. May 81, 89p AID-PN-AAK-359
Contract NPS-CS-0001-0-0004

Keywords: *Forestry, *Water supply, *Water pollution, *Guatemala, Hazards, Wildlife, Fisheries, Soil erosion, Watersheds, Forest trees, Plant ecology, Sewage treatment, *Environmental impacts, Pesticides, Government policies, Developing country application.

This report presents short-and long-term strategies to alleviate Guatemala's environmental problems. Initial sections detail the country's major environmental problems (deforestation in watersheds and the coastal zone, water quality and quantity, dangers to wildlife and fisheries, health and environmental effects of pesticide use, and urban/industrial pollution); highlight an economically-dominated view of development as a main cause of environmental degradation; discuss existing environmental policies, institutions, and programs; and explore constraints to solving environmental problems, especially reforestation and water pollution reduction efforts.

PB84-134378/GAA PC **A02**/MF **A01**
Board for International Food and Agricultural Development, Washington, DC.
Implementation of Principles for Effective Participation of Colleges and Universities in International Development Activities.
Occasional paper,
C. P. Magrath. May 81, 20p BIFAD/OP-5, AID-PN-AAK-374
Prepared in cooperation with Minnesota Univ., Minneapolis.

Keywords: *Education, Resources, National government, Government policies, Developing countries, Developing country application.

The future success of U.S. universities in implementing international educational programs (IEP's) will be determined more by the policies set in Washington than by the organizational principles embraced by the universities themselves. With this statement, the author begins a discussion of principles and models for the effective participation of U.S. universities in IEP's. The author notes that the principles for implementing IEP's are broad and depend upon the commitment of an institution's faculty and administration and on the availability of resources. It is the latter which is in short supply. Consequently, he focuses on the challenge of convincing policymakers in Washington of the worth of IEP's, a challenge based on the belief that Washington sets the nation's foreign policy agenda, on the assumption that U.S. universities are an untapped development resource, and on the expectation of reduced Congressional funding of IEP's.

PB84-134428/GAA PC **A10**/MF **A01**
American Public Health Association, Washington, DC. International Health Programs.
Report on Assistance to Develop a National Maternal and Child Health and Family Planning Program in Rwanda,
Rept. for 18 Jun 81-13 Aug 81,
W. H. Boynton, R. E. Downs, Y. Jemai, and S. E. Ross-Larson. 1981, 221p AID-PN-AAK-124
Contract AID-DSPE-C-0053

Keywords: *Health, *Population control, *Rwanda, Developing countries, Population growth, Government policies, Birth control, Sociology, Developing country application, *Family planning.

Rwanda is plagued by overpopulation. Until recently the Government of Rwanda (GOR) lacked a family planning (FP) program to reduce its population growth. Realizing the need for increased FP services, the GOR created the National Office of Population (ONAPO) in 1981 and commissioned this study to assess current MCH/FP programs and to recommend ways that the GOR and international donors can expand and improve them.

PB84-134444/GAA PC **A22**/MF **A01**
International Crops Research Inst. for the Semi-Arid Tropics, Patancheru (India).
Proceedings of the International Workshop on Pigeonpeas Held at Patancheru, India on December 15-19, 1980. Volume 1,
Y. L. Nene. Dec 80, 505p AID-PN-AAK-073
Sponsored in part by Indian Council of Agricultural Research, New Delhi.

Keywords: *Technology transfer, *Tropical regions, *Leguminous plants, *India, Planting, Cultivation, Phosphorus, Acclimatization, Pest control, Plant diseases, Seeds, Production, Plant physiology, Fertilizers, Soil properties, Food processing, Diets, Marketing, Plant genetics, Developing country application.

Increasing production and use of the pigeonpea, a grain legume grown throughout the tropics and especially in India, could greatly improve the diet of almost one-third of developing country populations. This report presents proceedings of an international pigeonpea workshop and consists of 43 papers on cropping systems (5), environmental adaptation (2), entomology (2), pathology and weed management (3), physiology and microbiology (4), plant nutrition (6), soils and water (3), seed production (4), utilization (7), and breeding methodologies and strategies.

PB84-134493/GAA PC **A05**/MF **A01**
Tetra Tech, Inc., Bellevue, WA.
Ecological Impacts of Sewage Discharges on Coral Reef Communities.
Sep 83, 96p EPA-430/9-83-010
Contract EPA-68-01-5906

Keywords: *Sewage disposal, *Ecology, *Water pollution, Coral, Nutrients, Sedimentation, Competition, Toxicity, Metals, Hydrocarbons, Tolerances(Physiology), Abundance, Ecosystems, Species diversity.

This report provides a synthesis of current information on the ecological impact of sewage discharges on coral reefs.

PB84-134667/GAA PC **A02**/MF **A01**
Texas A and M Univ., College Station. Sea Grant Coll. Program.
Seafood Quality Control: Processing Plant Personnel (Planta de Procesamiento de Personal),
R. Nickelson, II. 1983, 9p TAMU-SG-73-504, NOAA-83122702
Grant NA83AA-D-00061
Text in English and Spanish. See also PB84-134675.

Keywords: *Seafood, *Food, *Sanitation, *Food processing, Bacteria, Odor, Food deterioration, Public health, Regulations, Sea grant program.

This bulletin is designed to answer questions that a seafood processing plant employee might ask about sanitation and regulations he is required to follow.

PB84-134675/GAA PC **A02**/MF **A01**
Texas A and M Univ., College Station. Sea Grant Coll. Program.
Seafood Quality Control: Vessels (Embarcaciones).
Seafood quality control series,
R. Nickelson, II. 1983, 20p TAMU-SG-72-508, NOAA-83122701
Grant NA83AA-D-00061
See also COMF 72-11227. Text in English and Spanish.

Keywords: *Seafood, *Food storage, *Sanitation, Quality control, Bacteria, Harvesting, Food deterioration, Freezing, Food storage, Ice, Sea grant program.

The report describes sanitation requirements for holding seafood on fishing vessels.

PB84-134766/GAA PC **A06**/MF **A01**
Michigan State Univ., East Lansing. Dept. of Agricultural Economics
Assessment of Animal Traction in Francophone West Africa.
Working paper,
M. W. Sargent, J. A. Lichte, P. J. Matlon, and R. Bloom. Mar 81, 116p WP-34, AID-PN-AAK-127

Keywords: *Farming, *Animal energy, *Agricultural economics, *West Africa, Cultivation, Power, Horses, Equines, Farms, Investments, Soil fertility, Income, Loans, Maintenance, Developing country application, Oxen, Small farms, Trade offs.

The increased use of draft animals to provide power for tillage operations, manure to improve soil fertility, and meat for selling is expected to enhance small farm production and income in Francophone West Africa. Against a background discussionof the history and potential benefits of animal traction in the region, this report analyzes the effectiveness of draft animal technology (DAT) in improving the lot of small farmers by reviewing available literature and assessing 27 West African DAT projects.

PB84-134774/GAA PC **E08**/MF **E01**
Valtion Teknillinen Tutkimuskeskus, Espoo (Finland). Betoni- ja Silikaattitekniikan Lab.
Quality, Energy Saving Production and Fire Resistance Concrete Structures.
c1983, 154p VTT/SYMPOSIUM-39, ISBN-951-38-1890-X

Keywords: *Concrete, Production, Binders(Materials), Slags, Cements, Reinforced concrete, Precast concrete, Quality control, Fire resistance, *Energy conservation.

The quality of concrete structures, both in the field of load bearing frames and nonbearing elements as, for example facades, also requires structural development work. For use of waste materials, such as blast furnace slag, both the material properties and the production methods are studied. To increase the knowledge on the fire resistance of concrete structures the material properties at elevated and high temperatures are presented in the lectures as well as the behavior of structures subjected to fire.

PB84-134857/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Labor and Poverty.
World Bank staff working paper,
M. Lipton. c1983, 160p ISBN-0-8213-0266-3, WP-616
Library of Congress catalog card no. 83-19875.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., Nw, Washington, DC. 20433.

Keywords: *Nutrition, *Employment, *Rural areas, Low income groups, Employment, Unemployment, Nutritional deficiencies, Salaries, Unskilled workers.

This is the second of four Working papers about characteristics of the poor, and of the 'ultra-poor' at nutritional risk. It reviews the evidence on participation rates (PRs), duration of work, and rewards per period worked - both as they interact to form average labor income, and as they vary in time and space. Village materials from semi-arid areas of Western India and Northern Nigeria are the basic data. Related rural and urban evidence comes from Indian National Sample Survey rounds for 1971-2, for 1972-3, and for 1977-8; from work by the Nigerian Economic Society; from large-sample and synoptic labor-market analyses (notably by Bardhan, Binswanger and Rosenzweig); and from empirical studies in several developing countries. (Copyright (c) 1983 The World Bank.)

PB84-134865/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Brazil: An Interim Assessment of Rural Development Programs for the Northeast.
World Bank country study.
c1983, 134p ISBN-0-8213-0252-3
See also Portuguese version, PB84-134873. Library of Congress catalog card No. 83-17045.Color illustrations reproduced in black and white.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Project evaluation, *Rural areas, *Research and development, *Brazil, Developing countries, Water resources, Droughts, Farms, Foreign government, Projects.

The purpose of this report is to review the current federal programs for rural development and water resource use which are being used or could be used to help small farmers in Northeast Brazil. This assessment, interim in nature, is part of the continuing dialogue between the Government of Brazil and the World Bank on poverty alleviation and rural development strategies for the region, and on the nature and extent of the Bank's participation in rural development efforts in the next few years. (Copyright (c) 1983 The International Bank for Reconstruction and Development/The World Bank.)

PB84-134899/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Case Studies on Industrial Processing of Primary Products. Volume 2. Cocoa, Coconut Oil, Tea.
c1983, 298p ISBN-0-8213-0155-1 (v2)
Library of Congress catalog card no. 83-1200.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Coconuts, *Agriculture, *Food processing, Tea, Policies, Cocoa, Coconut oil.

In the last decade there has been increasing interest in aiding the economies of developing countries by expanding local processing of primary products. Much of the recent work undertaken by international organizations with regard to processing has addressed policy issues at the international level. It was intended that the findings would provide a basis for formulating some general principles regarding processing in developing countries. The studies for cocoa and coconut oil suggested that 'downstream' manufacturing warranted investigation of chains beyond what was done. It is hoped that these studies will help to advance discussion about increased processing in developing countries, not only of the products covered, but also more generally.

PB84-134923/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Managing State-Owned Enterprises.
World Bank staff working paper,
M. M. Shirley. c1983, 116p ISBN-0-8213-0241-8, WP-577
Also pub. as International Bank for Reconstruction and Development, Washington, DC. Management and Development Series no. 4. Library of Congress catalog card no. 83-14770.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Management techniques, Industries, Management, Efficiency, Competition, Objectives.

State-owned enterprises (SOEs) are increasingly important actors in developing economies, and more and more attention has been focused on how to enhance their operating efficiency. This paper suggests ways to improve SOE efficiency by examining on the special circumstances and constraints that are common to most of them. These include confused and conflicting objectives; government intervention in operating decisions; monopoly powers; and managers who are not held accountable for results or given the incentives to perform well, and whose skills are inappropriate for a commercial enterprise. Although all of these problems are complex and resistant to change, many countries have begun to develop useful approaches to correct some of the main weaknesses of SOEs. (Copyright (c) 1983 The World Bank.)

PB84-135201/GAA PC **A03**/MF **A01**
Agency for International Development, Washington, DC.
Indicators of Education in A.I.D. (Agency for International Development) Assisted Countries.
Statistical profile series.
Jul 81, 47p AID-PN-AAK-276

Keywords: *Education, Schools, Students, Adults, Expenses, Instructors, Females, Children, Effectiveness, Developing country application.

Education and human resource development have been and remain an A.I.D. priority. To assist in such efforts, A.I.D.'s Economic and Social Data Services Division (ESDS) has developed this reference of statistical indicators of education in AID-assisted countries, one in a series of ESDS statistical profiles prepared for sectors assigned high priority by A.I.D. Indicators are presented in the following subject areas: (1) the magnitude and rate of adult literacy and illiteracy; (2) primary and secondary school enrollment, including changes in enrollment, pupil-teacher ratios, female participation, and net enrollment by grade and age group; (3) efficiency of education, that is educational resources wasted through repetition of grades and dropping out from the educational system; and (4) education expenditures, including expenditures as percentages of GNP and of total public expenditures, expenditures by educational level and per student, and rate of return by educational level.

PB84-135250/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.

Energy Transition in Developing Countries.
c1983, 138p ISBN-0-8213-0225-6
Library of Congress catalog card no. 83-12478.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Energy, *Energy supply, Financing, Investments, Assessments, Energy demand, *Energy management, Energy supplies, World Bank.

Contents: The energy outlook; Energy demand management; Energy supply prospects and issues; Management of the energy sector; Financing energy investments; The role of the World Bank; Assumptions used for natural gas netback studies; World energy indicators.

PB84-135409/GAA PC **A07**/MF **A01**
Clemson Univ., SC. Dept. of Civil Engineering.
Development and Application of the Finite Element Method to the Modelling of Composite Masonry Walls.
Interim rept. no. 2,
S. C. Anand, D. J. Stevens, and R. H. Brown. Aug 83, 134p 4S-83, NSF/CEE-83212
Grant NSF-CEE80-26767

Keywords: *Concrete, *Construction, *Bricks, Construction joints, Cracks, Masonry, Stress analysis, Loads(Forces), Finite element analysis.

A longitudinal model is expanded to predict in-plane stresses in the collar joint of composite masonry walls. By the use of a simple fracture criterion, it is shown that the new longitudinal model can also be used to predict crack growth in reinforced and unreinforced composite masonry walls. The effects of the reinforcement are controlled by altering the yield stress or diameter of the reinforcing steel, the coefficient of shear friction, or the circle over which the shear friction forces are assumed to act. The crack model is shown to be mesh sensitive, and it is recommended that a dynamic mesh generator be incorporated to refine the mesh near the crack tip after each iteration. A comparison of the collar joint shear stress distributions predicted by the longitudinal model and a transverse model reveals large discrepancies.

PB84-135557/GAA PC **A12**/MF **A01**
Development Planning and Research Associates, Inc., Manhattan, KS.
Kenya National Crop Storage Study.
May 80, 272p AID-PN-AAJ-658
Contract AID/afr-C-1562

Keywords: *Crops, *Food contamination, *Food storage, *Kenya, Corn, Beans, Grain sorghum, Damage, Insects, Rodents, Birds, Fungi, Losses, Food inspection, Recommendations, Harvesting, Drying, Moisture content, Insecticides, Developing country application, Millet.

Crop losses during storage can have a significant impact on farmer income and on a nation's ability to reduce food imports or increase exports. This report discusses post-maturity losses of major food crops (corn, beans, sorghum, and millet) in Kenya. Crop samples were collected from small farmers, rural markets, and crop collecting and processing groups and were analyzed for bird, rodent, mold, and insect damage; for corn, tests were also made for aflatoxin contamination. To reduce these losses, the following practices are recommended: harvest corn at physiological maturity to reduce field losses; sun dry corn on platforms until a safe storage moisture level (13-14%) is reached; and shell and apply an insect protectant to grain that is to be stored for more than 3 to 4 months.

PB84-135581/GAA PC **A02**/MF **A01**
Futures Group, Inc., Glastonbury, CT.
Honduras: Los Efectos de la Poblacion sobre el Desarrollo Social y Economico (Honduras: The Effects of Population on Social and Economic Development).
1982, 25p AID-PN-AAK-305
Contract AID/pha-C-1195

Keywords: *Economic development, *Honduras, Vital statistics, Statistical analysis, Quality of life, *Demography, Predictions, Developing country application.

Unchecked and rapid population growth can impede general economic development and thereby reduce the individual's prospects for an improved quality of life. This report uses data from the United Nations, the World Bank, and the Pan American Health Organization to examine the relationship of demographic factors to socioeconomic development objectives in Honduras.

PB84-135805/GAA PC **A02**/MF **A01**
National Institutes of Health, Bethesda, MD.
Medicine for the Layman: Allergies,
M. A. Kaliner. Sep 81, 25p NIH-81-1948
Color illustrations reproduced in black and white.

Keywords: *Diseases, Health, Brochures.

The Clinical Center, recognizing the importance of providing information to facilitate intelligent decisions on health issues, created a unique lecture series featuring distinguished physician scientists working at the frontiers of biomedical research at the National Institutes of Health. The series--Medicine for the Layman--has provided an opportunity for thousands of people to learn more about how their bodies work and what they can do to maintain or improve their health.

PB84-136530/GAA PC **A04**/MF **A01**
Bureau of Land Management, Denver, CO.
Intensive Forest Inventory: A Selected Bibliography.
Technical note,
T. R. Costello, and L. Pettijohn. Sep 78, 67p TN-319

Keywords: *Forestry, Forest land, Areas, Forest trees, Defects, Inventories, Land reclamation, Roads, Wood products, Soils, Forest fires, Sampling, Structural timber, Recreation, Silviculture.

The report is a bibliography of research papers with application to or dealing with intensive forest inventory.

PB84-136761/GAA PC **A07**/MF **A01**
Indiana Univ. at South Bend. School of Public and Environmental Affairs.
Study to Determine the Effects of Alternative Taxes on Small Businesses.
Final rept.,
P. Kochanowski, P. Joray, J. Peck, and B. Vecchio. Aug 82, 134p
Grant SBA-1A-0021-01-0

Keywords: *Taxes, *Small businesses, Industries, Return on investment, Fixed investment, Failure, Risk.

Taxes impact business, large and small, in a variety of ways. Issues relating to return on investment, working capital positions, failure rates, expansion, and risk taking turn in part on the effects of taxation. On intuitive grounds, it would be suspected that alternative tax instruments would have a differential impact on small versus large businesses. This is so because those factors determining various tax bases appear to differ significantly by size of firm. Heretofore, however, these effects had yet to be adequately documented. The purpose of the report has been to study the differential impact of various tax sources by industry and by firm size. This study, which is national in scope, uses business tax return data from 1976. It includes firms that are sole proprietorships, partnerships, and corporations. Further, the study is performed by size of firm, and for industries by sizes of firms in those industries. Finally, we consider tax incidence between producers and consumers.

PB84-137603/GAA PC **A14**/MF **A01**
Chemonics International Consulting Div., Washington, DC.
Economic Evaluation of the Trypanosomiasis Problem in Zone One,
A. P. M. Shaw, and C. Kamate. Apr 81, 303p AID-PN-AAJ-717

Keywords: *Animal diseases, *Parasites, Diseases, *Livestock, Infectious diseases, Niger Valley, Economic analysis, Developing country application, *Mali.

Trypanosomiasis (sleeping sickness) is one of the major constraints to livestock development in Mali. This report projects, against a background of topographical, climatic, demographic, and agricultural information, the impact of trypanosomiasis over the next 20 years on cattle in a portion of southwest Mali along the Niger river designated as Zone 1 by the New Lands Activity (NLA)--the Malian agency responsible for tsetse research. The value of cattle lost to trypanosomiasis over the next two decades is projected to be between MF 392,933,000 and MF 577,367,000, with an average loss per infected animal of about MF 19,500. Using these figures, the report provides a benefit-cost analysis of various strategies to combat the disease. Overall, it is clear that the costs are high relative to the benefits to be expected.

PB84-137967/GAA PC **E04**/MF **E04**
Shri Ram Inst. for Industrial Research, New Delhi (India).
Immuno Biotechnology: Scope and Perspectives,
G. P. Talwar. 1983, 35p

Keywords: *Health, *Vaccines, *India, Immunity, Antibodies.

The author in this report attempts to link some recent developments in immunology with potential industrial applications. The world is at the threshold of a new era in immuno-biotechnology with promise of important applications for human welfare. The first products of hybridoma technology have gone beyond the research laboratory and are in industrial use. The inmate advantages of monoclonal antibodies, namely the possibility of production in abundant amounts of almost pure, high titre antibody with constancy of characteristics, render them suitable for large scale use. Their applications in diagnosis and therapy are likely to increase significantly. Vaccinology is entering a new phase. The second generation of vaccines is being rapidly succeeded by another trend, the search for sub-molecular domains of the protein molecule carrying the essential information.

PB84-138163/GAA PC**$155.00**
International Labour Office, Geneva (Switzerland).
Encyclopedia of Occupational Health and Safety. (Includes Volumes 1 and 2.) (3rd Revised Edition).
1983, 2602p* ISBN-92-2-103289-2
Errata sheet inserted.

Keywords: *Health, Toxicology, Epidemiology, Environments, Prevention, Standards, Legislation, *Occupational safety and health, Cancer, Immune response.

An indispensable reference work for all those concerned with the protection of workers' safety and health, and a source of practical information, presented objectively and systematically, even for those with no specialized medical or technical knowledge. All the different aspects of occupational health and safety, including such specialized subjects as toxicology, industrial hygiene, accident prevention, occupational and social medicine and ergonomics, are covered in concise, comprehensive and clearly written articles by internationally known specialists. Above all, the accent is placed on practical information and on the safety precautions to be taken against the main hazards encountered in each branch of industry. A comprehensive analytical index lists the main subjects dealt with in each article, together with those which, although treated more briefly, are nevertheless of some importance for occupational health and safety.

PB84-138767/GAA PC **E04**/MF **E04**
Transport and Road Research Lab., Crowthorne (England).
Conduct of Road Maintenance in Ghana,
P. W. D. H. Roberts, and P. K. Gaituah. c1983, 40p
TRRL-SUPPLEMENTARY-790

Keywords: *Roads, *Maintenance, *Ghana, Developing countries, Cost estimates, Manpower, Equipment.

This report is based on observations of the use of labor and equipment in carrying out road maintenance in Ghana. The object was to determine the outputs achieved utilizing different resources under the conditions prevailing in Ghana. This information is a fundamental requirement for calculating the actual cost of maintenance works, and is necessary to enable realistic planning of the maintenance that can be accomplished with given resources. It also assists in deciding between alternative resources and techniques for carrying out particular activites.

PB84-140888/GAA PC **E03**/MF **E03**
Regional Research Lab., Hyderabad (India).

Industrial Development News, Volume 1, Number 2, April 1983.
Quarterly rept.
Apr 83, 24p

Keywords: *Chemical industry, Design criteria, Performance evaluation, *Industrial development, Developing country application.

Contents: R&D as an opportunity for chemical engineers; Process design and engineering facilities at RRL; Industrial development.

PB84-140896/GAA PC **E03**/MF **E03**
Regional Research Lab., Hyderabad (India).
Industrial Development News, Volume 1, Number 1, January 1983.
Quarterly rept.
Jan 83, 24p

Keywords: *Chemical Industry, *Pest control, *Weed control, Licenses, *Industrial development, Biological pest control, Biological weed control, Water hyacinth, Developing country application.

Contents: Biological control of pests and weeds; Water hyacinth - a menace to boon; Industrial development; Industrial licences and letters of intent.

PB84-140904/GAA PC **E05**/MF **E05**
Regional Research Lab., Hyderabad (India).
International Conference on Water Hyacinth Held at Hyderabad (India) on February 7-11, 1983: Synopsis of Papers.
1983, 90p

Keywords: *Water hyacinth, *Aquatic plants, *Weed control, Inland waterways, Distribution(Property), Acclimatization, Temperature, Damage, Nutrients, Plant growth, Fishes, Bacteria, Methane, Sewage treatment, Developing country application, Biogas.

The main objectives of this conference was to highlight the problem of infestation of waterways by Water Hyacinth; to critically examine methods available, or likely to become available, for controlling weed; and to utilize to best advantage those methods which show promise to developing countries.

PB84-140912/GAA PC **E09**/MF **E09**
Oxford Univ. (England). Commonwealth Forestry Inst.
Problems and Opportunities in Tropical Rain-Forest Management.
Occasional paper,
P. E. Neil. 1981, 180p CFI/OP-16, ISBN-0-85074-060-6

Keywords: *Forestry, *Tropical regions, Soil properties, Climate, Forest trees, Plant reproduction, Plant growth, Forest fires, Lumbering, Asia, Africa, Burma, Malaysia, Nigeria, Theses, Silviculture.

This thesis attempts to describe the problems and opportunities that exist in methods used to manage the complex ecosystem of the Tropical Rain Forest. The emphasis is on natural regeneration of this forest type, although artificial regeneration methods are briefly discussed where appropriate.

PB84-141779/GAA PC **A05**/MF **A01**
Illinois State Water Survey Div., Champaign.
Guide to the Selection of Materials for Monitoring Well Construction and Ground-Water Sampling.
Rept. for May 82-May 83,
M. J. Barcelona, J. P. Gibb, and R. A. Miller. Jan 84, 87p EPA-600/2-84-024
Grant EPA-R-809966

Keywords: *Ground water, *Water quality, Chemical analysis, Sampling, Hydrology, Cost analysis, Construction materials, Monitoring.

The project was initiated to supplement and update existing guidance documents for effective ground-water monitoring efforts. The areas of primary concern were the potential sources of errors in chemical analyses of subsurface samples caused by well construction and sampling materials, techniques or procedures. A critical review of the literature was conducted on various aspects of monitoring natural waters, materials' performance data and unpublished information on the success of various ground-water monitoring techniques. The results of the literature review were collected and reviewed by a panel of experts from government agencies, private hydrological consulting firms, the manufacturing industry and national standards organization. The publication consists of a thorough discussion of ground-water monitoring stratigies, requirements and pitfalls. It concludes with a detailed treatment of the costs and benefits of recommended monitoring design criteria.

PB84-142256/GAA PC **A08**/MF **A01**
World Health Organization, Copenhagen (Denmark). Regional Office for Europe.
Health Aspects of Chemical Safety. Interim Document 10. Progress Report July 1981-December 1982,
A. Gilad, and S. Tarkowski. 1983, 168p
See also PB83-214171.

Keywords: *Toxic substances, *Management planning, *Environmental surveys, *Safety, Public health, Industrial hygiene, Ecology, Assessments, Risks, Exposure, Accident prevention, Water pollution, Pesticides, Specialized training, Personnel development, *Occupational safety and health, Health risks, Environmental health, Developing country application, Indoor air pollution.

The coverage of this progress report includes manpower development and training in toxicology, contingency planning for accidents and emergencies involving the release of toxic chemicals, impact and risk assessment as a decision-making tool, and collaboration and exchange of information concerning control methods and procedures. Nineteen annexes cover various WHOROE meetings during the reporting period.

PB84-142264/GAA PC **A13**/MF **A01**
World Health Organization, Copenhagen (Denmark). Regional Office for Europe.
Health Aspects of Chemical Safety. Interim Document 12. Allergy and Hypersensitivity to Chemicals,
J. F. Greally, V. Silano, K. E. Andersen, G. Bendixen, and H. Bundgaard. 1983, 300p
See also PB84-142256. Proceedings of a joint workshop held at Frankfurt (Germany) on October 12-15, 1982.

Keywords: *Health, *Environmental surveys, Exposure, Industrial hygiene, Accident prevention, *Safety, Absorption(Biology), Respiratory system, Public health, Skin diseases, *Toxic substances, Health risks, Environmental health, Developing country application, Indoor air pollution.

The papers comprising this work are: Allergy to Chemicals - Problems and Perspectives; Public and Occupational Health Significance of Allergic Responses and Hypersensitivities Induced by Man-Made Chemicals; Allergies and Intolerances Caused by Exposure to Chemicals-Immunological Mechanisms; Clinical Manisfestations of Allergies, Hypersensitivities and Intolerance to Chemicals; Occupationally Related Skin Allergies; Substances Inducing Allegic Pulmonary Reactions at the Workplace; Absorption and Biotransformation - Intolerance to Certain Foreign Chemicals; Respiratory Tract Allergy Due to Low Molecular Weight Chemicals; Immunochemical Mechanisms Involved in Allergy to Chemicals; Predictive Skin and Mucosa Testing Methods; Measures for Preventing Exposure to Chemicals; and the Workshop Summary Report.

PB84-142330/GAA PC **A02**/MF **A01**
Robert S. Kerr Environmental Research Lab., Ada, OK.
Algae Removal by the Overland Flow Process.
Journal article,
J. L. Witherow, and B. E. Bledsoe. 1983, 10p EPA-600/J-83-138
Pub. in Jnl. Water Pollution Control Federation, v55 n10 p1256-1262 Oct 83.

Keywords: *Algae, *Ponds, *Sewage disposal, Removal, Nitrogen, Storage, Standards, Reprints, Suspended solids.

Control of algae production will be necessary when lagoons are utilized as a preapplication treatment process for overland flow. The overland flow process has a surface discharge and must meet secondary treatment limitations to be viable. Brief summaries of other algae removal investigations are presented which do not show a relationship between operational and design criteria and discharge concentrations greater or less than the secondary treatment limits for total suspended solids. The data from an investigation conducted at the Robert S. Kerr Environmental Reserach Laboratory indicate both the number and species of algae in the applied wastewater control the ability of the overland flow process to meet secondary treatment limits for total suspended solids.

PB84-144062/GAA PC **A20**/MF **A01**
World Health Organization, Copenhagen (Denmark). Regional Office for Europe.
Health Aspects of Chemical Safety. Interim Document 11. Combined Exposures to Chemicals,
S. W. Andrzejewski, S. Tarkowski, M. Ikeda, C. Ioannides, and E. J. Fairchild. 1983, 467p*
See also PB84-144070. Sponsored in part by United Nations Environment Programme and United Nations Development Programme. Prepared in cooperation with Institute of Occupational Medicine, Lodz (Poland). Proceedings of a seminar held at Lodz, Poland on October 18-22, 1982.

Keywords: *Health, *Chemical industry, *Environmental surveys, Exposure, Biochemistry, Assessments, Pharmacology, Industrial hygiene, Public health, Metabolism, Toxicity, *Toxic substances, Chemical reaction mechanisms, Cancer, Developing country application, Health risks, Environmental health.

The papers making up this report were presented at a course in Lodz Poland held from 18-22 October 1982. The introductory papers are: Industry - Environment of Combined Hazards; Concepts of Effects of Combined Exposures to Chemicals; Basic Problems of Pharmacological Interactions; and Biochemical Mechanisms of Chemical Interactions. The other 22 reports are grouped under the following headings: Interactions of Chemicals; Evaluation of Effects and Assessment of Combined Exposures; Interactions of Chemical and Physical Agents; Factors Influencing Individual Susceptibility to Environmental Chemicals.

PB84-144070/GAA PC **A15**/MF **A01**
World Health Organization, Copenhagen (Denmark). Regional Office for Europe.
Health Aspects of Chemical Safety. Interim Document 13. Environmental Toxicology,
G. E. Walsh, J. H. Duffus, J. I. Waddington, C. M. Brown, and A. Balmain. 1983, 336p*
See also PB83-214171 and PB84-0144062. Prepared in cooperation with Heriot-Watt Univ., Edinburgh (Scotland). Proceedings of a seminar held at Heriot-Watt Univ., Edinburgh, United Kingdom on 16-20 August, 1982.

Keywords: *Health, *Chemical industry, *Environmental surveys, Laboratory animals, Plants(Botany), Malignant neoplasms, Animals, Plankton, Microorganisms, Metabolism, Ecology, Estuaries, Water pollution, Benthos, Public health, Safety, Industrial hygiene, *Toxic substances, Ecosystems, Developing country application, Cancer, Monitoring, Xenobiotics, Petrochemical industry, Toxicokinetics, Health risks, Environmental health.

These Proceedings consist of the following papers: The Use of Animals in Toxicity Testing; Biotransformation of Xenobiotics - General Principles; Fundamentals of Toxicokinetics; Mutagenicity of Environmental Chemicals - I. The Basis of Mutation & II. Screening Tests and Their Evaluation; Cancer and its Chemical Causation; Microorganisms and Toxicants; Effects of Toxicants on Plankton; Effects of Toxicants on Terrestrial Plants; Effects of Toxicants on Aquatic Plant Communities; Effects of Toxicants on Benthic Ecosystems; Ecological Monitoring in Estuaries and Coastal Areas; The Use of Community Structure in Pollution Monitoring; and Environmental Monitoring and the Petrochemical Industry.

PB84-144849/GAA PC **A04**/MF **A01**
Transportation Research Board, Washington, DC.
Urban Buses: Planning and Operations.
H. S. Levinson, R. P. Guenthner, B. Wells, D. H. Pickrell, and D. O. Nelson. 1983, 57p*
Library of Congress catalog card no. 83-26855.

Keywords: *Urban planning, *Buses(Vehicles), *Transportation management, Travel time, Delay time, Operating costs, Transportation models, Maintenance, Transportation planning, Transit buses, Commuter transportation, Park and ride.

The 7 papers in this report deal with the following areas: analyzing transit travel time performance; modeling bus delays due to passenger boardings and alightings; economics of commuter express bus operations; sources of rising operating deficits in urban bus transit; home-origin transit travel analysis model; analysis of regional park-and-ride and express bus service; and, role of quantitative analysis in bus maintenance planning.

PB84-145184/GAA PC **A07**/MF **A01**
National Inst. on Drug Abuse, Rockville, MD. Office of Science.
Measurement in the Analysis and Treatment of Smoking Behavior.
Research monograph,
J. Grabowski, and C. S. Bell. Nov 83, 132p* NIDA/RM-48, NIDA/OS-83-02
Also pub. as National Inst. on Drug Abuse, Rockville, MD. Office of Science rept. no. DHHS/PUB/ADM-83-1285. See also PB83-252692.

Keywords: *Health, *Drugs, Behavior, Therapy, Analysis, Tobacco, Nicotine, Carbon monoxide, Cardiovascular system, Respiratory system, Surveys, Populations.

The monograph is the product of National Cancer Institute-National Institute on Drug Abuse sponsored meeting on technical and pragmatic considerations in the implementation of studies on tobacco use. The meeting provided an overview of measurement ranging from biological fluid assay, through behavioral topographical analysis, to population survey techniques as well as combined approaches. The monograph, in addition to providing an overview of available techniques, describes the usefulness of specific measurement techniques in various settings as well as delineating their limitations.

PB84-145432/GAA PC **A02**/MF **A01**
National Center for Health Services Research, Rockville, MD.
Synopses of Health Status Indices,
M. K. Chen. 1983, 16p NCHSR-83-88

Keywords: *Health, Public health, Development, Tests, Policies, Programs, Health services research.

The National Center for Health Services Research (NCHSR) has supported efforts to develop and test a variety of health status indices. The ultimate goal of all health services and biomedical research is improved health status of individuals, communities or populations. This compendium presents the results of intramural work in the form of a brief synopsis of each of 12 indices. Acknowledging that there are basic philosophical and methodological differences among scholars working in this field, the Center is publishing the compendium as a resource document describing health status indices selected from the literature. Such indices are intended for health services researchers or planners interested in synthesizing isolated items of health data into an index number which represents an outcome of health policies or programs.

PB84-145440/GAA PC **A02**/MF **A01**
Virginia Univ., Charlottesville.
Illness of the Child: The Cultural Context of Childhood Diarrhea in Northeast Brazil.
Executive summary 1 Mar 81-30 Jun 82,
M. K. Nations. 1982, 16p NCHSR-84-1
Grant PHS-HS-04437

Keywords: *Diseases, *Children, *Brazil, Foreign countries, Gastrointestinal diseases, Developing countries, Sociocultural factors.

This research sought to test the hypothesis that sociocultural factors, specifically behavioral patterns and belief systems, play a major role in the occurrence and management of gastrointestinal infections of infants and children of northeastern Brazil. Qualitative and quantitative methods from medical anthropology, epidemiology and microbiologic research techniques, were used to explore the relationships between human behavior patterns and belief systems and childhood diarrhea. The study population consisted of a random sample of 50 households, three neighborhoods of affluent professionals, migrant wage laborers, and poor farmers. Comparative analyses were made of the traditional healing practices performed by village healers and modern, western influenced medical management of childhood diarrhea disease treatment.

PB84-145465/GAA PC **A03**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Engineering Control Technology Branch.
Control Technology Feasibility Study of the Use of Engineering Controls in Hospitals: Preliminary Survey Report of Veteran's Administration Medical Center, Cincinnati, Ohio,
S. E. Spottswood, and S. L. Kercher. Sep 83, 33p CT-143.12A

Keywords: *Environmental surveys, *Health, Gases, Exposure, Toxicity, Inspection, Hazardous materials, Drugs, Hospitals, Medical personnel, Ventilation, *Toxic substances, *Occupational safety and health, Veterans hospitals, Ethylene oxide.

A preliminary survey of sterilization and anesthetic gas administration operation was conducted at the Veteran's Administration Medical Center, Cincinnati, Ohio on September 29, 1982. Gas sterilization procedures employed ethylene-oxide (75218) (EtO) to decontaminate medical supplies and equipment. Aeration of supplies and materials after sterilization was performed to eliminate hazardous residual quantities of EtO and its reaction products, ethylene-glycol (107211) and ethylene-chlorohydrin (107073). The principal engineering controls used were isolation, general dilution ventilation, and preventive equipment maintenance procedures. During the sterilization exhaust cycle, EtO concentrations ranged from 0 to 18 parts per million (ppm).

PB84-145515/GAA PC **E03**/MF **E03**
Cranfield Inst. of Tech. (England). Coll. of Aeronautics.
Atomisers for the Aerial Application of Herbicides: Ideal and Available,
J. Spillman. Dec 82, 22p ISBN-0-902937-69-3, R-8207

Keywords: *Crops, *Herbicides, Spray nozzles, Particle size, Performance evaluation, Dispersing, Tests, Windward drift, Wind tunnels, Great Britain.

This work related to the fact that sprays with a mean volume diameter of 225 micrometers and narrow range are required to minimize spray drift of herbicides on aerial application. The performance of currently available atomisers was evaluated in wind tunnel tests with respect to: droplet size distribution at various aircraft speeds; orientation of the nozzle; and blade settings of rotating cage atomisers. Results indicated that the flat fan hydraulic nozzle 8005 set at an angle of 117 degrees to 135 degrees to the oncoming airflow i.e. downward and backwards, was the most effective. At 117 degrees a maximum percentage of the spray was within 25% of 225 micrometers while at 135 degrees a smaller percentage was within the desired band, fewer small droplets were produced. This atomiser promised to reduce application rates by half.

PB84-145630/GAA PC **A03**/MF **A01**
Center for Energy and Environment Research, San Juan, PR.
Update Puerto Rico Energy Alternatives, 1983,
N. Azziz, M. Iriarte, and J. H. Betancourt. May 83, 48p CEER-X-164
Sponsored in part by Department of Energy, Washington, DC.

Keywords: *Energy source development, *Energy, *Puerto Rico, Substitutes, Economic analysis, Developing country application.

Puerto Rico is almost entirely dependent for oil for its energy, and steps should be taken to reduce this dependence. In addition to current measures being taken to reduce consumption, the most promising area in reducing oil consumption is electrical production. A program to reduce oil consumption by 50% for electrical generation within the next 15 years could be considered as an appropriate objective. The most promising alternatives for fuels are nuclear or coal with the optimum solution utilizing both. In addition, a promising source of energy in smaller quantities is available from bagasse. This energy source appears economically competitive with coal. A commercial enterprise for producing biomass could compete favorably in the local enery market. The main restriction to its broader use will be the use of land for more higher value production.

PB84-145648/GAA PC **A02**/MF **A01**
Center for Energy and Environment Research, San Juan, PR.
Development of Alternative Energy Science and Engineering in the Caribbean,
J. A. Bonnet, Jr., and W. C. Koehler, Jr. Nov 83, 17p CEER-X-165
Sponsored in part by Department of Energy, Washington, DC.

Keywords: *Caribbean, *Research and development, *Energy source development, *Energy, Substitutes, Research projects, Solar energy, Developing Country Application, Wind power, Biomass.

This paper describes a pilot project designed to improve the capabilities of Caribbean universities and research institutes in helping solve the energy problems of the region. Most of the region is almost entirely dependent on imported petroleum to satisfy its energy needs. That dependency has exascerbated economic problems with the escalation of petroleum prices in the past ten years. A potential solution to reduce both the high degree of dependence and economic costs is to develop other energy systems. The region is blessed with solar, wind, ocean, biomass, and geothermal resources that could be exploited to reduce and displace oil consumption. One approach is to develop the scientific and engineering capabilities of regional universities. Under the auspices of the Association of Caribbean Universities and Research Institutions (UNICA) a project to foster cooperative research efforts to assist in the introduction of alternative energy solutions has been developed. The UNICA project utilized the research workshop format. A network of scientists and engineers working in energy was established to promote cooperation, interchange of technical information and development of joint projects.

PB84-145655/GAA PC **A05**/MF **A01**
Center for Energy and Environment Research, San Juan, PR.
Changes in Diel Primary Production in Joyuda Lagoon on July 7 and 8, 1983,
R. D. Rice, and G. Owen. Aug 83, 80p CEER-M-166
Sponsored in part by Department of Energy, Washington, DC.

Keywords: Diurnal variations, Temperature measurement, Salinity, Oxygen, Dissolved gases, Wind velocity, Water flow, Chlorophylls, Respiration, Tropical regions, Graphs(Charts), Tables(Data), Benthos, *Puerto Rico, *Coasts.

On 7 and 8 July, 1983, a 28 hour study was conducted in Joyuda Lagoon. Dissolved oxygen, temperature, and salinity measurements were taken at two hour intervals from seven regions within the lagoon to the Guanajibo Channel. Primary production within the lagoon water column appears sufficient to meet planktonic respiratory and carbon requirements. The volume of water exchanged between the lagoon and the Guanajibo Channel was approximately equal, but the total volume of water flowing into the lagoon was insignificant in relation to its volume. Over an extended period of time, Joyuda Lagoon may enrich the surrounding coastal waters.

PB84-145663/GAA PC **A02**/MF **A01**
Center for Energy and Environment Research, San Juan, PR.
Costs and Benefits Assessment of Hatillo Energy Cane. Plant and First-Conservation Crops, 1982-1983,
A. G. Alexander. Apr 83, 13p CEER-B-174
Sponsored in part by Department of Energy, Washington, DC.

Keywords: *Cost benefits, *Sugar, *Farming, Yield, Area, Sugar cane, Fuels, Assessments, Planting, Cultivation, Cost analysis, Harvesting, Land use, Puerto Rico, Developing country application.

Energy cane yields and costs from a 25-acre study at Hatillo are reviewed for both intensive and conservation production scenarios. Maximum yield from intensive production was 125 tons whole cane per acre year, at a cost of $9.82/ton. Maximum yield from conservation agriculture was 53 tons/acre year, at a cost of $7.47/ton. The potential value of energy cane is presented in the context of a multiple-products commodity vs. a traditional sugar and mollasses commodity. Conservation culture, though economical, is limited by the need for intensive inputs every second year, and a greater commitment of land area to produce a given quantity of cane.

PB84-145713/GAA PC **A06**/MF **A01**
Center for Energy and Environment Research, San Juan, PR.
Production of Sugarcane and Tropical Grasses as a Renewable Energy Source.
Annual rept. no. 1, 1977-78,
A. G. Alexander. 1978, 108p CEER-B-169
Grant DOE-EG-77-G-05-5422

Keywords: *Grass, *Sugarcane, *Farming, *Tropical regions, Cultivation, Fossil fuels, Yield, Maturation, Spacing, Performance evaluation, Growth regulators, Plant regulators, Plant genetics, Fertilizers, Plant nutrition, Greenhouses, Field tests, Harvesting, Tables(Data), Developing country application, Saccharum.

Tropical grasses from Saccharum and related genera are being evaluated as candidates for intensive production of solar-dried biomass. Categories of candidate grasses include short-, intermediate-, and long-rotation species for intensive co-production with conventional food commodities. Minimum-tillage candidates are also sought for extensive production on marginal lands. The hybrid forage grass Sordan 70-A (Northrup-King Company) is the outstanding short-rotation plant tested to date. It completes both the tissue-expansion and maturation phases within 10 weeks, yielding at least 4 tons of oven-dry biomass per acre. Napier grass (var. Common Merker) is a promising intermediate-rotation crop which possibly may be exceeded by several napier grass hybrids. Direct comparisons of sugarcane hybrids with napier grass indicate that sugarcane is an inferior candidate for short-term production of tropical forages. Additional progress was made in sugarcane growth control with chemical growth regulators.

PB84-145929/GAA PC **A03**/MF **A01**
Center for Energy and Environment Research, San Juan, PR.
Effect of Food Level and Antibiotic in Rearing Larvae of 'Ucides cordatus' Linnaeus (Brachyuran, Gecarcinidae),
G. S. Grose, and G. Owen. Jul 83, 34p CEER-M-167
Sponsored in part by Department of Energy, Washington, DC.

Keywords: *Food, Sewage, Bioassay, Survival, Larvae, Crustacea, Exposure, Concentration(Composition), *Aquaculture.

Larvae of Ucides cordatus Linnaeus, the mangrove crab, were reared in a flow-through culturing apparatus under two different feeding levels and the condition of antibiotic or non-antibiotic. Survival under all conditions was low, yielding statistically insignificant results, but the trends showed better larval survival under antibiotic conditions. Little survival difference was noted between different feeding levels. Suggestions on culturing brachyuran larvae in the future are presented as part of this report. A short exploratory bioassay was also conducted. Using the flow-through system, a mixture of brachyuran zoeae were exposed to three concentrations of primary-treated sewage for 24 hours, and a 24 hour LC50 was determined through analyses of the data.

PB84-147446/GAA PC **A04**/MF **A01**
Center for Energy and Environment Research, San Juan, PR.
Evaluacion de lo Publicado por Nuestros Academicos Sobre Ciencias Humanidades (Evaluation of Publication for our Academics on Sciences and Humanities),
J. A. Bonnet, Sr. 1984, 51p CEER-X-168
Sponsored in part by the Department of Energy, Washington, DC. Text in Spanish.

Keywords: *Education, *Puerto Rico, Theories, Universities, Collection, Developing country application.

The publication is a compendium of the principle ideas of some 48 publications of academics at the University of Puerto Rico over the last two decades.

PB84-148295/GAA PC **A12**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Criteria for a Recommended Standard: Occupational Exposure to Styrene.
Sep 83, 264p DHHS/NIOSH/PUB-83-119

Keywords: *Environmental surveys, Exposure, Toxicity, Inspection, Hazardous materials, Protective clothing, Humans, Laboratory animals, Assessments, *Toxic substances, *Occupational safety and health.

The National Institute for Occupational Safety and Health (NIOSH) recommends that worker exposure to styrene in the workplace be controlled by compliance with the following sections. These recommendations are designed to protect the health and provide for the safety of workers for up to a 10-hour workshift, 40-hour workweek, over a working lifetime. Compliance with all sections of the recommended standard should prevent or greatly reduce the risk to exposed workers of adverse effects. NIOSH considers the recommended environmental limits for styrene to be upper boundaries of exposure. Thus, employers should make every effort to maintain exposure concentrations as low as possible. This recommended standard will be subject to review and revision as necessary.

PB84-148311/GAA PC **E04**/MF **E04**
National Inst. of Nutrition, Hyderabad (India).
Some Therapeutic Diets.
1981, 45p

Keywords: *Health, *Food, Therapy, India, Developing country application.

Dietetics has yet to find its rightful place in developing countries therapeutics. A majority of the teaching hospitals do not have qualified dietitians. An important factor which has probably contributed to the rather unsatisfactory position accorded to dietetics is the task of authoritative information useful to physicians and nurses in the prescription of suitable therapeutic diets. This report contains a brief outline of the major approaches towards the prescription of therapeutic diets in certain important clinical conditions.

PB84-148618/GAA PC **A12**/MF **A01**
National Research Council, Washington, DC.
Underutilized Resources as Animal Feedstuffs.
Final rept.
1983, 271p ISBN-0-309-03382-9
Contract USDA-59-32R6-0-39
Sponsored in part by Department of Health and Human Services, Washington, DC., Food and Drug Administration, Rockville, MD. Bureau of Veterinary Medicine., and Department of Agriculture, Ottawa (Ontario). Library of Congress Catalog card no. 83-13311.

Keywords: *Animal feeds, *Nutrition, *Livestock, Food processing, Wastes, Fruits, Vegetables, Dairy products, Byproducts, Industrial wastes, Wood wastes, Cattle, Poultry, Swine, Nutritive value, Food contamination, Toxicity, Farm crops, Plant residues(Organic), Bacteria, Whey, Manure.

Many potentially valuable feed sources, some of which have substantial nutritional value and are available inexpensively and in large quantities, have been underutilized by livestock producers. These products include food processing wastes, such as vegetable and fruit processing residues; dairy whey and tannery by-products; wastes from industrial processing and from municipalities; forest products and pulp and papermill residues; crop residues; aquatic plants; and animal waste. This report discusses the nutritional value of the cited classes of resources and also considers the safety factors of feeding to livestock since they may contain pathogenic organisms or be contaminated with pesticides, drugs, heavy metals, or other substances toxic toxic to livestock.

PB84-149004/GAA PC **A99**/MF **E04**
Center for Energy and Environment Research, San Juan, PR.
Proceedings of the Pan American Conference Energy (1st) and National Conference on Renewable Energy Technologies (2nd). Volume 1.
Aug 83, 695p* CEER-X-163
Presented at the Conferences of the Pan American Confederation of Engineering Association (17th) (UPADI-82), San Juan, Puerto Rico, August 1-7, 1983. Sponsored in part by Department of Energy, Washington, DC.

Keywords: *Biomass, *Wind energy, *Renewable energy, Technology, Developing country application.

A total of 115 papers were presented to some 400 participants at the conference. This volume contains 20 biomass papers, 5 wind energy papers, and 11 solar power papers.

PB84-149285/GAA PC **A05**/MF **A01**
Coastal Resources Foundation, Gloucester, VA.
Coastal Dunes for Protection and Sand Resources,
M. Nichols, and C. Cerco. Jan 83, 95p
Sponsored in part by Puerto Rico Dept. of Natural Resources, San Juan. Prepared in cooperation with Island Resources Foundation, St. Thomas, VI.

Keywords: *Soil erosion, *Puerto Rico, Sands, Ocean waves, Erosion, Hurricanes, Beach nourishment, Extraction, Height, Sites, *Coasts, Developing country application, Wave run up.

Massive sand extraction of Puerto Rico's north coast dunes has reduced their natural capability for protection. This report provides the scientific basis and engineering data for managing the dunes to protect the coast from high waves and long-term erosion and to provide a source of sand for extraction. Additionally, the probable impact of submarine sand extraction on beach drawdown, interception of nearshore sand transport, and storm wave modifications is assessed. Of the three submarine deposits, extraction of the Cabo Rojo west deposit has a lower risk of impact on beaches than other sites. The size, height, and stability of residual dunes at Isabela, Hatillo, and Carolina is inadequate in many places for long-term protection of life and property. As a result of high northern swells, October 11-13, 1982, dune ridges collapsed at Hatillo, Camuy, and Carolina, and the resulting washover deposits offer little protection.

PB84-149293/GAA PC **A03**/MF **A01**
Centro Mesoamericano de Estudios sobre Tecnologia Apropiada, Guatemala City.
El Tzetz o Bledo (Amaranto): Una Planta Alimenticia de Origen Mesoamericano que Tiene Muchas Proteinas pero que se Esta Olvidando (Tzetz or Wild Amaranth (Amaranthus deulis): An Edible Mesoamerican Plant of High Protein but Forgotten).
May 78, 29p
Text in Spanish.

Keywords: *Food, *Plants(Botany), History, Cultivation, Cooking, Developing country application.

The booklet discusses the use and history of the wild amaranth. Methods of cultivation and cooking recipes are given for the three types of wild amaranth. Suggestions for further research are also made.

PB84-149335/GAA PC **A02**/MF **A01**
Puerto Rico Univ., Rio Piedras. Agricultural Experiment Station.
Demanda y Consumo de Alimentos en Puerto Rico. IV. Patrones de Compra - Proporcion de Familias Que Compraban Alimentos (Demand and Consumption of Food in Puerto Rico. 4. Purchasing Patterns - Proportion of Families That Buy Food),
L. Rodriguez de Zapata, and M. I. Rijos de Marini.
Sep 82, 23p BULL-269
Text in Spanish, summary in English. See also PB84-149343.

Keywords: *Food supply, Urban areas, Rural areas, *Puerto Rico, Food habits, Developing country application.

This report discusses the percentage of families purchasing foods in households that were interviewed two or three times every four months from March 1977 to February 1978. In a previous bulletin of this station the individual percentage computed in each of the three surveys was presented and analyzed. The year-expanded data relates to 692 families out of 848 interviewed in the first survey, 653 in the second, and 674 in the third. Homemakers mentioned 317 specific foods in their pattern of food demand. These foods were classified in 26 categories. For the purpose of this study, the specific foods were identified according to the nature of the processing as fresh, frozen, or canned.

PB84-149343/GAA PC **A03**/MF **A01**
Puerto Rico Univ., Rio Piedras. Agricultural Experiment Station.
Demanda y Consumo de Alimentos en Puerto Rico. V: Ingreso de la Familia (Demand and Consumption of Food in Puerto Rico. 5. Family Income),
L. Rodriguez de Zapata, and I. Velasco de Grillasca.
Mar 83, 49p BULL-270
Text in Spanish. See also PB84-149335.

Keywords: *Income, *Food, Food supply, Urban areas, Rural areas, Salaries, Social welfare, *Puerto Rico, Households, Developing country application, Families.

This Research investigates in particular the family income variable as part of the household food demand series for the study undertaken by the Agricultural Experiment Station. Among other socio-economic and demographic variables, income plays an important role in determining the nature and magnitude of the demand for foods at the household level. The following aspects of the income variable were studied by family size and by urban, rural zone: (1) households with a working member; (2) number of working members; (3) identification of the working member (husband, wife, children or other relatives, male head or female head); (4) number of income sources; and (5) source(s) of income (salaries, wages, services, pensions, food stamps or other). All frequency distributions for the above aspects were obtained for unmarried heads and for married heads separately. The income source was also discussed for families without a working member and for those with at least one working member.

PB84-149376/GAA PC **A03**/MF **A01**
Center for Energy and Environment Research, Mayaguez, PR.
Ecological Analysis of Spatial and Temporal Patterns of Pelagic Ecosystem Components Potentially Interacting with an OTEC (Ocean Thermal Energy Conversion) Plant Near Punta Tuna, Puerto Rico: Physical Characteristics.
Final rept.,
J. M. Lopez, and L. J. Tilly. 1983, 45p CEER-M-157-A

Keywords: *Caribbean, *Oceanographic surveys, Internal waves, Eddies, Water masses, Circulation, Time series analysis, Tidal currents, Thermoclines, Ocean temperature, Salinity, Coasts, Puerto Rico, Developing country application. Power plant siting program.

This hydrographic study characterizes the Punta Tuna area as a potential site for an OTEC power plant. Seven cruises were conducted at approximately two month intervals. Each cruise included at least 22 hydrocast stations, six done as serial stations in a small area to reveal temporal and small scale variability. The results of the analysis of these data so far indicate a bi-seasonality in the dynamics. Mesoscale eddies and meanders are a common feature of the circulation pattern on Puerto Rico's southern coast. The time series studies have shown their existence of a very energetic internal wave field with relatively large amplitude waves at the diurnal and semi-diurnal tidal frequencies. The results in terms of an OTEC power plant indicate the thermal resource to be at least a 20C thermal gradient in the upper 100 m year round.

PB84-149442/GAA PC **A06**/MF **A01**
Economic Research Service, Washington, DC. Foreign Development and Trade Div.
Taiwan's Agricultural Development: Its Relevance for Developing Countries Today,
R. P. Christensen. Apr 68, 103p FAER-39

Keywords: *International trade, *Agricultural economics, *Taiwan, Exports, United States, Technical assistance, Imports, Production, Manpower, Farms, Irrigation, Marketing, Prices, Agricultural products, Demand(Economics), Capital.

Taiwan has become an important export market for U.S. products--$333 million in 1967, including $111 million worth of agricultural products. Taiwan's rapid economic growth made possible the cessation of U.S. economic aid and technical assistance in 1965, although Public Law 480 shipments have continued as needed. Increases in agricultural productivity have helped Taiwan achieve a high rate of economic growth.

PB84-149525/GAA PC **E04**/MF **E04**
National Inst. of Nutrition, Hyderabad (India).
Low Cost Nutritious Supplements.
1978, 40p

Keywords: *Nutrition, *Food, Infants, Children, Diets, Low income groups, *India, Developing country application.

In this report various recipes for the feeding of infants and children have been drawn up. The recipes have been formulated after a careful study of the local conditions and the dietary habits of the community. The preparations were actually tested in poor communities and have been found to be acceptable. Information contained in this report should prove of practical value to all those engaged in nutrition education programs among rural communities.

PB84-149533/GAA PC **E04**/MF **E04**
National Inst. of Nutrition, Hyderabad (India).
Nutritional Disabilities,
M. M. Ram. 1981, 64p

Keywords: *Diseases, *Nutrition, *Health, Public health, Growth, *India, Developing country application, Blindness, Fluorosis, Lathyrism.

Malnutrition has been identified as a cause for physical and mental disabilities in about 100 million people in the world. Nutritional disabilities are major public health problems in developing countries. This report illustrates some of the consequences of various types of malnutrition. In this report, a few articles on different aspects of nutritional disabilities have been brought together.

PB84-149574/GAA PC **E08**/MF **E01**
Indian Society of Desert Technology, Jodhpur.
Transactions of Indian Society of Desert Technology and University Centre of Desert Studies. Volume 8, Number 1, January 1983. (Proceedings Part 2).
Jan 83, 161p
Prepared in cooperation with University Center of Desert Studies, Jodhpur (India).

Keywords: *Agriculture, *Crops, Deserts, Forest trees, Growth, Farm crops, *Fertilizers, Leguminous plants, Mulches, Irrigation, Soils, Wheat, Plant growth, Growth regulators, Populations, Water consumption, Solar energy, Insecticides, Livestock, Developing country application, Eucalyptus, Dry farming, Biogas.

The proceeding contain 30 technical papers presented at the conference which were concerned with agriculture. These papers have been divided into 4 groups: Animal Science, Plant Science, Physical Science, and Miscellanous.

PB84-149590/GAA PC **A08**/MF **A01**
Puerto Rico Univ., Mayaguez.
Tratamiento de Mostos Utilizando el Filtro Anaerobio (Treatment of Must Using an Anaerobic Filter).
Master thesis,
R. M. Negron. Dec 82, 160p
Text in Spanish.

Keywords: *Waste treatment, *Distilleries, Performance evaluation, Feasibility, Developing country application.

This study reports on the feasibility of treating the slops from rum distilleries with an anaerobic filter composed of an oxygen free reactor filled with a plastic filtering media, commercially known as 'Actifil' with a diameter of 5/8 inches (16mm). This filter is similar in appearance to an aerobic biofilter (trickling filter). The main difference between the two systems is that on the anaerobic filter the flow is upward so that the filter medium is always completely submerged.

PB84-149624/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Maintenance of Wide Band Blades in Sawmills,
M. Paretti. 1983, 39p UNIDO-ID/WG.369/9
Paper presented at the Technical Course on Criteria for the Selection of Woodworking Machines, Milan, Italy, 10-26 May 1982.

Keywords: *Sawmills, *Maintenance, Welding, Brazing, Metal working, Sharpening, Tension leveling, Developing country application.

The report relates to wood technology, with special reference to equipment for sawmills - covers: special treatment and maintenance required for blades of large bandsaws for prevention of breakdowns and improving efficiency of operations; sequence of required maintenance; tools needed. Diagrams, illustrations. Additional references: maintenance and repair, equipment.

PB84-149673/GAA PC **E08**/MF **E08**
Institution of Engineers (India), Nagpur.
All India Seminar and Discussion on Manual for Design and Construction of RCC Elevated Water Tanks Held at Nagpur on October 9-10, 1976.
Oct 76, 171p

Keywords: *India, *Water supply, Design, *Construction, Economic factors, Optimization, Pile foundations, Flexural strength, Developing country application, Computer aided design.

The economy of water supply scheme can be achieved both with respect to materials as well as cost by judicious adoption of modern methods of optimisation and construction. This volume contains the Manual for Design and Construction of R.C.C. Elevated Water Tanks and the various papers presented in the seminar. The main topics covered are: Construction of Two Overhead R.C.C. Reservoirs on Pile Foundations; Water Tanks, Optimisation of Cylindrical Tanks; Computerized Design of R.C.C. Elevated Water Tanks; Design of a Water Tank Using Shell Structure of Uniform Strength; and Various Aspects of Water Tanks.

PB84-149988/GAA PC **A03**/MF **A01**
SG Associates, Inc., Annandale, VA.
Listing of New Bus Technology Applications.
Final rept. Sep 82-Jul 83,
H. S. Glasser. Dec 83, 36p* UMTA-MA-06-0126-83-4, , DOT-TSC-UMTA-83-29
Contract DTRS57-81-C-00053

Keywords: *Buses(Vehicles), Urban transportation, Passenger transportation, Engines, Performance, Acceptability.

This report presents the findings of research on bus purchases and demonstrations by transit systems in the U.S. involving innovative vehicles or equipment. Purchases and demonstrations have been catalogued for the last four years. The purchases included in this report show innovative equipment and new manufacturers in the American market. The trend toward mass bus purchases through consortia and a heightened interest in vehicles built by non-traditional manufacturers are shown. The report demonstrates that there is strong interest among transit systems for vehicles that can meet the requirements imposed by local conditions.

PB84-150374/GAA PC **A06**/MF **A01**
United States-Mexico Border Health Association, El Paso, TX.
U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective,
J. C. Smith, C. W. Warren, and J. G. Nunez. Nov 83, 115p
Report of Survey Information on Reproductive Age Women Living in the Border Areas of the United States and Mexico, 1979. Prepared in cooperation with Centers for Disease Control, Atlanta, GA., and Mexico Inst. of Social Security.

Keywords: *Health, *Children, *Birth control, United States, *Mexico, Females, Fertility, *Women, *Family planning, *Contraceptives.

Health officials in the United States and Mexico have long recognized that special attention is required to idenify and deal with health problems unique to people who live along the U.S.-Mexico border. For almost four decades the border area has been the focus of the United States-Mexico Border Health Association. In the interest of maintaining and improving the health of reproductive-age women living along the border, the Association adopted a resolution in 1978 indicating that information was needed on the utilization of family planning and maternal health services. The governments of both the United States and Mexico responded to the resolution by conducting household probability surveys in the border area in 1979. This monograph reports the findings from each country's survey. Its aim is to provide information that will be useful to local, state, and regional health officials and other interested persons involved in the planning and delivery of family planning and maternal health services in the border area.

PB84-150531/GAA PC **A03**/MF **A01**
Centro Latinoamericano de Demografia, Santiago (Chile).
Procedimiento para la Elaboracion de Resumenes (Procedured for the Preparation of Abstracts).
Manual no. 3.
Feb 80, 42p CEPAL/CELADE/L-3
Text in Spanish.

Keywords: *Demography, *Information systems, Manuals, Information retrieval, Latin America, Absracting, Developing country application.

This manual recounts the experiences of DOCPAL (Documentation on Population for Latin America) in preparing abstracts and serves as a guide for information centers in the region which wish to follow the same procedures, whether they work with a manual or computerized system. This manual presents the characteristics and the contents of the abstracts, the guidelines for the preparation of the abstracts for DOCPAL, and indications of the use of the Content Analysis Page and the Bibliographic Registration Card.

PB84-150655/GAA PC **E06**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Manufacture and Quality Estimation of Cast Spare Parts,
Z. Gorny, and J. Marcinkowski. 19 Oct 83, 102p UNIDO-ID/WG.407/2
Presented at Experts' Core Industries Group Meeting on the Manufacture of Cast/Forged Parts, Cairo, Egypt, 3-17 November 1983.

Keywords: *Castings, Quality assurance, Developing country application.

The report covers (1) classification of (a) casting materials (b) operating conditions (c) cast parts; (2) identification of cast material; (3) substitute alloys; (4) application of casting processes in the manufacture of spare parts for machinery and equipment.

PB84-150663/GAA PC **A03**/MF **A01**
United Nations Industrial Development Organization, Vienna (Austria).
Ceramic Glazes: Basic Information,
Z. A. Engelthaler. 1 Nov 83, 28p UNIDO/IO.563

Keywords: *Ceramics, Ceramic coating, Ceramic coatings, Developing country application.

The report covers (1) development of modern glazes (2) raw materials used; other constituents (3) glaze compositions (4) colored glazes; ceramic stains.

PB84-150671/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Economic Appraisal of Small-Scale Hydro Power Projects,
K. Goldsmith. 5 Aug 83, 16p UNIDO/ID/WG.403/29
Presented at a Workshop on Small Hydro Power (3rd), 7-15 March 1983, Kuala Lumpur, Malaysia.

Keywords: *Hydroelectric power, Hydroelectric power generation, *Economic analysis, Developing country application, Small-scale hydroelectric power plants.

The report covers (1) preconditions for considering such projects (2) methods of economic appraisal: cost benefit analysis; comparison of present worth of cash flow; internal rate of investment returns; comparison of production costs (3) case study of an economic analysis with reference to a project in Thailand.

PB84-151174/GAA PC **A03**/MF **A01**
Municipality of Metropolitan Seattle-METRO, WA.
Transportation Energy Management. Transit Operator Facilities. Volume 1. Office Guide.
Sep 82, 44p* DOT-I-83-10
See also PB84-151182. Sponsored in part by Urban Mass Transportation Administration, Washington, DC.

Keywords: *Transportation management, Maintenance costs, Operating costs, Heat loss, Heating load, Lighting equipment, Cost analysis, Data acquisition, *Energy management, *Energy conservation.

While the bulk of energy expenditures cover vehicle operations, utility costs for fixed facilities have also increased. This report, in two volumes, is intended to assist transit operators assess means of saving money through reducing fixed facility energy usage. Many measures are at no or low cost, whereas others requiring larger investments may be eligible for capital assistance from UMTA. This handbook presents practical, step-by-step instructions for developing and implementing a six-part conservation program. These steps include organizing a conservation team, creating an energy profile, a walk-through survey, implementation procedures, evaluation of measures, and the permanent program. This volume is an office reference guide with instructions for collecting and analyzing the data. Reference material and a case study are included as appendices.

PB84-151182/GAA PC **A06**/MF **A01**
Municipality of Metropolitan Seattle-METRO, WA.
Transportation Energy Management. Transit Operator Facilities. Volume 2. Field Guide.
Sep 82, 111p* DOT-I-83-11
See also PB84-151174. Sponsored in part by Urban Mass Transportation Administration, Washington, DC.

Keywords: *Transportation management, Maintenance costs, Operating costs, Heat loss, Heating load, Lighting equipment, Cost analysis, Data acquisition, *Energy management, *Energy conservation.

While the bulk of energy expenditures cover vehicle operations, utility costs for fixed facilities have also increased. This report, in two volumes, is intended to assist transit operators assess means of saving money through reducing fixed facility energy usage. Many measures are at no or low cost, whereas others requiring larger investments may be eligible for capital assistance from UMTA. This handbook presents practical, step-by-step instructions for developing and implementing a six-part conservation program. These steps include organizing a conservation team, creating an energy profile, a walk-through survey, implementation procedures, evaluation of measures, and the permanent program. This volume includes forms and instructions for collecting and analyzing the data. Reference material and a case study are included as appendices.

PB84-151505/GAA PC **A04**/MF **A01**
Centro Latinoamericano de Demografia, Santiago (Chile).
Indizacion de Documentos y Utilizacion del 'Tesauro Multilingue Sobre Poblacion' en un Sistema Manual de Documentacion (Indexing Documents and Use of the 'Multilingual Thesaurus on Population' in a Manual System of Documentation).
Manual no. 4.
Feb 80, 65p CEPAL/CELADE/L-4
Text in Spanish.

Keywords: *Information sources, *Demography, *Information systems, Index terms, Manuals, Information retrieval, Latin America, Developing country application, Caribbean Islands.

This manual recounts the experiences of DOCPAL (Documents on Population in Latin America) in indexing the documents input into its data base, and serves as a guide to information units in Latin America and the Caribbean which have adopted manual or semi-mechanized techniques for handling information. It includes definitions of the terminology of indexing to provide a reference mark and the principal characteristics of the process. The manual also includes a description of the tools and guidelines for indexing, placing emphasis on the use of the Multilingual Thesaurus on Population for the analysis of information, and Uniterm Cards for registration of this process.

PB84-151513/GAA PC **A03**/MF **A01**
Centro Latinoamericano de Demografia, Santiago (Chile).
Procedimiento para la Recuperacion de Informacion en un Sistema Manual de Documentacion Sobre Poblacion (Procedures for the Retrieval of Information in a Manual System of Documentation on Population).
Feb 80, 50p CEPAL/CELADE/R-6
Text in Spanish.

Keywords: *Information sources, *Demography, *Information systems, Manuals, Information retrieval, Latin America, Developing country application.

This manual recounts the experiences of DOCPAL (Population Documentation System in Latin America) in the retrieval of information (documents input into the collection), and serves as a guide to the information units which have adopted manual or semi-mechanized techniques for the handling of population documentation. It includes definitions of terminology of information retrieval, and to present a section on the formulation of strategies for searching and characteristics of the retrieval of information.

PB84-151521/GAA PC **A07**/MF **A01**
Centro Latinoamericano de Demografia, Santiago (Chile).
Procedimiento para la Utilizacion de la Tarjeta de Registro Bibliografico (Procedures for the Use of Bibliographic Registration Cards).
Manual no. 2.
Feb 80, 146p CEPAL/CELADE/L-2
Text in Spanish.

Keywords: *Information sources, *Demography, *Information systems, Manuals, Information retrieval, Latin America, Developing country application.

This manual is a guide for the use of DOCPAL's (Documentation on Population in Latin America) Bibliographic Registration Cards to register the terms which describe a specific document. It is designed for use by information units using a manual system that can be used in conjunction with Uniterm or Termatrex, etc. cards. The Cards are also compatible with the Bibliographic Description Pages and Content Analysis Pages of DOCPAL's computerized system. The manual is divided into three parts. The first part includes the general aspects, definitions and other characteristics that are necessary to know for the use of the Cards. The second part includes a detailed description of each of the registration elements on the Cards along with a description of the place where they are annotated. The third part is on the practical use of the Cards and their use in other special situations. Proper use of the cards will facilitate all the cooperating units' input of their data into the DOCPAL system for the benefit of all users.

PB84-152057/GAA PC **A09**/MF **A01**
Corporacion de Fomento de la Produccion, Santiago (Chile).
Manual Ahorro de Energia en la Industria (Energy Conservation Manual for Industry).
c1979, 200p
Text in Spanish.

Keywords: *Industrial plants, Manuals, Guidelines, Heating, *Energy conservation, Energy audits, Developing country application.

This manual gives general guidelines on which to base an energy conservation program, signals situations and opportunities for energy savings in an industrial plant, provides information for easy quantification of energy loss, and signals how to correct deficiencies in certain important aspects such as combustion and insulation. One chapter deals with heat audits, an extremely useful tool for identifying areas on which one should concentrate to achieve energy savings. The manual also describes general heating systems with a view to pointing out ways to increase efficiency and eliminate defects, including steam systems and oil, coal, and firewood combustion.

PB84-152610/GAA PC **A06**/MF **A01**
Dane County Regional Planning Commission, Madison, WI.

Estimating Transportation Energy Consumption of Residential Land Types.
Final rept.
Feb 83, 122p DOT-I-83-26
Sponsored in part by Federal Highway Administration, Madison, WI. Wisconsin Div., and Urban Mass Transportation Administration, Washington, DC.

Keywords: *Energy management, *Transportation management, Cost analysis, Economic analysis, Methodology, *Land use.

This report is the result of a demonstration project in Dane County, Wisconsin, which examined the relationships between residential land use development and transportation related energy consumption. To face the dilemma between encouraging development to improve the local tax base and the need to maintain efficient travel without overloading limited community resources, a simple set of factors describing transportation energy consumption per dwelling unit, for a range of differing residential densities and locations, were developed. The technique is presented in such a manner that other regions can replicate the process to produce factors specific to their areas. It also provides a means to report energy consumption factors and impacts to State and local officials concerned with the planning process for transportation.

PB84-152628/GAA PC **A03**/MF **A01**
Municipality of Metropolitan Seattle-METRO, WA.
Transportation Energy Management: Current Transit Operator Activities.
Sep 82, 42p DOT-I-83-01
Sponsored in part by Urban Mass Transportation Administration, Washington, DC.

Keywords: *Transportation management, *Motor vehicles, *Traffic engineering, Energy conservation, Fuel storage, Emergency rations, Maintenance, Buses(Vehicles), Surveys, Fuel supply.

Due to the rapid rise in the price of energy during the 1970's, transit operators have initiated a variety of activities designed to improve management of their energy use. This report describes the results of a national survey of energy management activities undertaken by 100 transit systems in the United States and Canada. The survey reports on activities in five areas: energy crisis contingency planning; energy conservation in bus maintenance, repair and operating facilities; energy conservation petroleum fueled bus fleets; energy conservation awareness programs; and fuel supply and price protection strategies. The report presents the survey methodology and respondent characteristics, survey results and the questionnaire.

PB84-152826/GAA PC **A11**/MF **A01**
North Carolina State Univ. at Raleigh.
Waste Management Control Handbook for Dairy Food Plants.
Final rept.,
W. J. Harper, R. E. Carawan, and M. F. Parkin. Feb 84, 244p* EPA-600/2-84-043
Grant EPA-R-803374
Prepared in cooperation with Ohio State Univ., Columbus., and New Zealand Dairy Research Inst., Palmerston North (New Zealand).

Keywords: *Food industry, *Waste water reuse, *Water pollution, Water conservation, Handbooks, Industrial wastes, Losses, Regulations, Sewers, Ordinances, Economic factors, Management, Cost effectiveness, Licenses, Education, Maintenance, Equipment, Sampling, Chemical analysis, Biochemical oxygen demand, Energy conservation.

Waste control is resource management control in dairy food plant operations. Appreciable reductions can be achieved in product, water, energy, labor, packaging losses and sewer surcharges. A good program in waste control can increase the profit margin by more than 10%, as well as being a program that helps improve the environment in which we live. Another result of the operation of an effective waste program is to increase the overall efficiency of a dairy food plant. Waste control should be recognized as being equal in significance to quality control and justifies the assignment of one or more individuals to the waste control program with resulting economic gain to the dairy food plant. This Handbook is predicated on the viewpoint that an effective control program requires the full attention of a responsible person reporting directly to the plant manager. Details are presented in this manual on the implementation of this strategy.

PB84-153170/GAA PC **A06**/MF **A01**
Research Triangle Inst., Research Triangle Park, NC.
Community Health Information Policy (CHIPS): Evaluation of Application of Several Existing National Data Collection Methodologies to Selected Small Geographic Areas. Phase 3. Evaluation and Analysis.
Final rept.
31 Jan 83, 116p RTI-250U-2277, NCHS-81-2279
Contract PHS-233-81-2052

Keywords: *Health, Evaluation, Surveys, Methodology, National Center for Health Statistics, Health care.

The overall goal of this evaluation project was to examine the usefulness at the local Health System Agency (HSA) level of the content and methodology of four national surveys conducted by the National Center for Health Statistics (NCHS). The four surveys are: (1) Health Interview Survey (HIS); (2) Health and Nutrition Examination Survey (HANES); (3) National Ambulatory Medical Care Survey (NAMCS); and (4) Hospital Discharge Survey (HDS). Initially, the project was to evaluate and determine a cost-beneficial method of conducting local area surveys of the HIS, HANES, NAMCS, and HDS type that would provide useful data for planning purposes at the HSA level. Usefulness to the national surveys would come primarily from methodological sub-studies.

PB84-153543/GAA PC **A05**/MF **A01**
California State Dept. of Water Resources, Sacramento.
Agricultural Waste Water Reverse Osmosis Pretreatment,
C. Hild, R. Lindholm, D. Brice, and G. Klein. Jun 83, 80p* OWRT-C-00211-R(0529)(1)
Contract DI-14-34-0001-0529

Keywords: *Agricultural wastes, *Waste water, *Desalination, Desalting, Brackish water, Brines, Ion exchanging, Regeneration(Engineering), Recirculation, Pilot plants, Design criteria, Performance evaluation, Cooling water.

Investigations were made to demonstrate that an ion-exchange (IX) softening system regenerated with reverse-osmosis (RO) reject brine can be operated successfully on a sustained basis to provide softened feed water for an RO system used to desalt brackish water. Various combinations of operating conditions were evaluated to determine sustainable conditions that would produce the largest quantity of softened water per unit of regenerant used. During the investigations, two transparent plastic IX columns were operated alternately in softening and regeneration modes. The IX-RO system was operated in an automated mode to demonstrate that the system could be operated without frequent attention. It was concluded from this study that an IX system regenerated with RO reject brine can be operated successfully to provide softened feed water for the RO system. The pilot plant operating under optimum conditions produced 1.4 gallons of softened water per gallon of regenerant used. The IX-RO system can be automated.

PB84-154517/GAA PC **E05**/MF **E01**
Swedish Council for Building Research, Stockholm.
German-Swedish Seminar on Integrated Planning: Ecological Systems and Physical Planning,
C. Jerkbrant, and K. Jonasson. 1983, 83p ISBN-91-540-4019-1, D20:1983

Keywords: *Urban planning, *Environmental impacts, Ecology, Urban renewal, Recreational facilities, Land use, Heat pumps, Heating, Natural resources, Energy conservation, Environment protection.

Partial contents: Physical planning in Sweden; Integrated planning with special regard to energy and environmental aspects; Ecology and physical planning; Renewal of the inner city in Halmstad; Communal open-space planning as an approach to integrated planning; The use of land and vegetation in urban areas; Investigation and report on natural heat resources and storage of heat; Energy systems and urban design; and Local energy supply concepts as a new task of integrated planning.

PB84-154749/GAA PC **A04**/MF **A01**
Radian Corp., Salt Lake City, UT.
Safety Information Profile: Ship Building and Repairing,
D. J. Burton. Apr 79, 60p
Contract PHS-NIOSH-210-78-0130

Keywords: *Ships, *Safety, Hazards, Accident prevention, Standards, Exposure, Welding, *Occupational safety and health, *Toxic substances, SIC 3731.

A safety information profile is presented for the ship building and repair industry (Standard Industrial Classification 3731). Major ship building activities such as steel frame and hull construction, propulsion, and support equipment outfitting, are described. Safety and health hazards and controls are discussed. Injury and illness statistics are given, and compensation claims are discussed. Related studies are cited. Growth trends and new technology in the industry and existing standards are reviewed. A list of names and addresses of industry associations, unions, and other interested parties is provided. It is concluded that industry accident rates and compensation claims are high. Explanations include poor safety programs, insufficient standards and enforcement, the hazardous nature of the work itself, and exploitation of compensation laws. Comprehensive study of accident causes and prevention techniques is recommended.

PB84-155217/GAA PC **A10**/MF **A01**
Washington State Univ., Pullman.
On-Farm Improvements to Reduce Sediment and Nutrients in Irrigation Return Flow.
Final rept.,
L. G. King, B. L. McNeal, F. A. Ziari, and S. C. Matulich. Feb 84, 208p EPA-600/2-84-044
Grant EPA-R-805527

Keywords: *Irrigation, *Water pollution, Nutrients, Regulations, Licenses, Drainage, Phosphorus, Columbia River Basin, Technical assistance, Ditches, Sprinkler irrigation, Nonpoint sources, Cost sharing.

Research on an 800-hectare irrigated tract in central Washington's Columbia Basin Project studied the effects of on-farm improvements on reduction of the discharge of sediment and nutrients via irrigation return flow. Technical assistance and financial cost-sharing were provided to participating farmers. Physical improvements included pipes to convey tailwater to improved drains, sediment basins and mini-basins, concrete lining of head ditches, gated pipe systems, and conversion of furrow irrigated land to sprinkler systems (center pivot and solid set). Structural improvements greatly reduced the sediment discharge from the overall tract. Measures which controlled sediment loss were not equally effective in reducing phosphorus loss, even though reductions in phosphorus loss were significant.

PB84-155613/GAA PC **A04**/MF **A01**
Transportation Research Board, Washington, DC.
Criteria for Use of Asphalt Friction Surfaces.
Final rept.,
W. J. Halstead. Nov 83, 52p TRB/NCHRP/SYN-104, ISBN-0-309-03565-1
Sponsored in part by American Association of State Highway and Transportation Officials, Washington, DC., and Federal Highway Administration, Washington, DC. Library of Congress catalog card no. 83-51531.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418.

Keywords: *Asphalt, *Pavements, Construction materials, Highway transportation, Highway planning, Performance evaluation, Friction, Regulations.

This synthesis will be of special interest to pavement designers, material engineers, and others concerned with upgrading pavements by application of asphalt friction surfaces. Guidelines are presented for deciding when it is appropriate to use various types of friction courses. The most common types of asphalt surfaces used to upgrade frictional characteristics of pavements are seal coats, open-graded mixes, and dense-graded mixes. This report of the Transportation Research Board provides information on current engineering practices, legal and regulatory considerations, and criteria for selection of appropriate types of asphalt friction courses.

PB84-155621/GAA PC **A03**/MF **A01**
Radian Corp., Salt Lake City, UT.
Safety Information Profile: Waste Disposal of Industrial Solvents,
A. V. Simonson. Apr 79, 40p
Contract PHS-NIOSH-210-78-0130

Keywords: *Safety, *Waste disposal, *Chemical industry, Exposure, Trends, Regulations, Standards, Incinerators, Hazardous materials, *Occupational safety and health, SIC 28.

A safety information profile is presented for industrial solvents waste disposal (Standard Industrial Classification 28). Different types of incineration methods are described together with landfill and evaporation processes. Potential health and safety hazards are presented and existing controls are discussed. No related accident and illness statistics, exposure levels, or related studies are available. Industry trends are described. Existing and proposed regulations are reviewed. A summary of groups of generally used industrial solvents is included. A list of names and addresses of industry associations and other interested parties is provided. It is concluded that the waste solvent disposal industry is currently undergoing changes, and that proposed standards will directly influence the direction of these changes. A thorough study is recommended to evaluate the effectiveness of present and proposed regulations.

PB84-155670/GAA PC **A04**/MF **A01**
Agricultural Cooperative Service, Washington, DC.
Cooperative Fluid Milk Processing: Perspective of Opportunities and Problems.
Research rept.,
J. B. Roof. Nov 83, 51p ACS/RR-31

Keywords: *Milk, *Food processing, Dairy products, Agricultural economics, Businesses, Cost analysis, *Cooperatives.

Three successful and three less successful specialized fluid milk processing cooperatives were compared to determine if there were consistent differences in operating and financial policies and other selected factors. Successful cooperatives' management consistently made use of carefully planned capital investments and members allowed their cooperatives to build adequate member equity to finance feasible and profitable projects.

PB84-156314/GAA PC **A05**/MF **A01**
Illinois Dept. of Energy and Natural Resources, Springfield.
Relative Effects of Chlorine and Ammonia from Wastewater Treatment Facilities on Stream Biota,
R. C. Heidinger, W. M. Lewis, M. H. Paller, J. H. Waddell, and L. J. Wawronowicz. Sep 83, 100p
DOCUMENT-83/24
See also PB84-156322. Sponsored in part by Southern Illinois Univ. at Carbondale. Fisheries Research Lab.

Keywords: *Sewage disposal, *Ecology, *Water pollution, Outfall sewers, Sampling, Chlorine, Ammonia, Wastewater, Fresh water fishes, Secondary treatment, Chlorination, Toxicity, Statistical analysis, Abundance, Weight(Mass), Tables(Data), Illinois, Tertiary treatment, Water pollution effects(Animals).

Biological, chemical and physical variables were monitored in three streams receiving municipal wastewater from the Champaign-Urbana (Illinois) treatment facilities from November 1979 to February 1983. In Phase I, the streams received chlorinated secondary effluents; in Phase II, non-chlorinated secondary effluents; and in Phase III, non-chlorinated tertiary treated effluents. The most important conclusions of this study are: (1) The elimination of residual chlorine from good quality secondary sewage effluents will result in quantitative and qualitative restoration of the fish communities in average Illinois streams receiving such effluents. (2) The reduction of ammonia concentrations from typical secondary treatment levels to extremely low levels by tertiary treatment will not necessarily effect obvious improvements in the fish communities of average Illinois streams. (3) The cessation of chlorination will result in marked quantitative improvements in the macroinvertebrate communities of streams receiving good quality secondary effluent, but tertiary treatment may be needed for both quantitative and qualitative recovery.

PB84-156793/GAA PC **A99**/MF **A01**
Environmental Protection Agency, Research Triangle Park, NC. Environmental Criteria and Assessment Office.
Air Quality Criteria for Particulate Matter and Sulfur Oxides. Volume 2.
Final rept.
Dec 82, 624p* EPA-600/8-82-029B-F
See also PB84-156785 and PB84-156801, and PB84-120401.
Also available in set of 3 reports PC E99, PB84-156777.

Keywords: *Air pollution, Sources, Concentration(Composition), Chemical analysis, Toxicology, Visibility, Climate, Vegetation, Humans, Air pollution effects(Materials), Air pollution effects(Plants), Atmospheric chemistry.

The document evaluates and assesses scientific information on the health and welfare effects associated with exposure to various concentrations of sulfur oxides and particulate matter in ambient air. The literature through 1980-81 has been reviewed thoroughly for information relevant to air quality criteria, although the document is not intended as a complete and detailed review of all literature pertaining to sulfur oxides and particulate matter. An attempt has been made to identify the major discrepancies in our current knowledge and understanding of the effects of these pollutants. Although this document is principally concerned with the health and welfare effects of sulfur oxides and particulate matter, other scientific data are presented and evaluated in order to provide a better understanding of these pollutants in the environment. To this end, the document includes chapters that discuss the chemistry and physics of the pollutants; analytical techniques; sources; and types of emissions; environmental concentrations and exposure levels; atmospheric chemistry and dispersion modeling; acidic deposition; effects on vegetation; effects on visibility, climate, and materials; and respiratory, physiological, toxicological, clinical, and epidemiological aspects of human exposure.

PB84-156892/GAA PC **A03**/MF **A01**
Agricultural Cooperative Service, Washington, DC.
Dairy Product Manufacturing Costs at Cooperative Plants,
K. C. Ling. Nov 83, 31p ACS/RR-34

Keywords: *Dairies, Cost analysis, Cheeses, Manpower, Electricity, *Milk, Dried foods, Cost estimates, Butter, *Cooperatives.

Dairy cooperatives are major manufacturers of hard products (cheese, butter, and powder). To operate the manufacturing plants most efficiently, cooperative managers must know how scale of plant, capacity utilization, and seasonal volume variation affect plant costs so they can adjust operations and make sound investment recommendations to their boards. Cost data are summarized for 14 plants manufacturing cheese, butter, and powder and average costs are presented for each product. Average cost curves are estimated for each plant.

PB84-156967/GAA PC **A08**/MF **A01**
Department of Agriculture, Washington, DC.
Forest Fires and Their Control,
E. S. Artsybashev. c1983, 169p TT-77-52050
Trans. from mono. Lesnye Pozhary i Bor'ba s Nimi, 1974 by K. Bakaya. Sponsored in part by National Science Foundation, Washington, DC. Special Foreign Currency Science Information Program.

Keywords: *Forestry, Towers, *Fire safety, Fire control, Infrared detection, Aerial reconnaisance, Weather modification, Helicopters, Aircraft, Translations.

The nature of forest fires, their development and spread depending on the conditions of forest vegetation and a combination of various meteorological factors has been described on the basis of scientifically collected data. The author describes the designs of various fire observation towers and masts, and proposes unique technical methods ensuring the safe ascent of the observer to the top as well as his descent with the minimum expenditure of manpower and also describes technical equipment and methods of detecting and extinguishing forest fires.

PB84-157056/GAA PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Changing Trends in the Red Meat Distribution System.
Agriculture economic rept.,
L. A. Duewer. Feb 84, 34p AER-509

Keywords: *Agricultural economics, *Food, Sales, Beef, Pork, Food industry, Food services, Retail trade, Wholesale trade, Fast foods.

Meat wholesalers, grocery retailers, and food service firms are becoming fewer in number but larger in size. Direct sales from packer to retailer are decreasing the number of meat wholesalers. The growth of boxed beef is contributing to the shift to more direct sales from packer to retailer. Away-from-home consumption of red meat is increasing slowly in relation to at-home consumption. Chains are gradually taking more of the grocery retailing and food service industry market. Fast food outlets are the fastest growing segment of the food service industry.

PB84-157247/GAA PC **A11**/MF **A01**
Culp/Wesner/Culp, El Dorado Hills, CA.
Guidance for Planning the Location of Water Supply Intakes Downstream from Municipal Wastewater Treatment Facilities.
Technical rept.,
P. Tobin. Apr 78, 241p
Contract EPA-68-01-4473

Keywords: *Water supply, *Sewage disposal, *Sewage treatment, Intake systems, Decision making, Sites, Mathematical models, Cost analysis, Public health, Municipalities, Streams, Precipitation(Chemistry), Microbiology, Bacteria, Turbidity, Metals, Activated carbon treatment, Clarification, Trickling filters, Fluorides, Case studies.

The purpose of this report is to present information and guidelines relevant to the location of surface water supply intakes downstream from municipal wastewater discharges. Decisions on the location of water supply intakes must be made by informed professionals at the local level after careful consideration of all factors and this report is intended to provide information that will be useful to local professional and review officials. The report reviews the data required for evaluating intake location, available stream modeling techniques, capability and costs of water and wastewater treatment processes and the public health implications of upstream wastewater discharges.

PB84-158039/GAA PC **A22**/MF **A01**
Illinois Univ. at Urbana-Champaign. Dept. of Civil Engineering.
Design Recommendations for Concrete Tunnel Linings. Volume 1. Results of Model Tests and Analytical Parameter Studies.
Final rept. Apr 78-Jul 81,
S. L. Paul, A. J. Hendron, E. J. Cording, G. E. Sgouros, and P. K. Saha. Nov 83, 519p UMTA-MA-06-0100-83-1, , DOT-TSC-UMTA-82-37
Contract DOT-TSC-1504
See also PB84-158047.

Keywords: *Soils, *Concrete, *Tunneling, *Construction, Structural design, Subways, Underground supporting, Ultimate strength method, Stress strain diagrams, Loads(Forces), Finite element analysis.

The overall objective of this research effort was to formulate recommendations for the structural design of final concrete linings for tunnels and underground stations for mass transit use that are based on ultimate strength concepts of concrete behavior and that take full advantage of interaction between the linings and ground. This report describes model tests and analytical studies that were performed to augment background information based on experience, interviews with design engineers, and review of the literature to propose design recommendations for concrete tunnel linings. Tests of model arches that represent underground stations and circular linings that represent continuous tunnels in rock-like media are described.

PB84-158047/GAA PC **A08**/MF **A01**
Illinois Univ. at Urbana-Champaign. Dept. of Civil Engineering.

Design Recommendations for Concrete Tunnel Linings. Volume 2. Summary of Research and Proposed Recommendations.
Final rept. Apr 78-Dec 82,
S. L. Paul, A. J. Hendron, E. J. Cording, G. E. Sgouros, and P. K. Saha. Nov 83, 174p UMTA-MA-06-0100-83-3, , DOT-TSC-UMTA-83-16
Contract DOT-TSC-1504
See also PB84-158039.

Keywords: *Concrete, *Construction, *Tunneling, *Soils, Structural design, Subways, Underground supporting, Ultimate strength method, Stress strain diagrams, Loads(Forces), Finite element analysis.

The overall objective of this research effort was to formulate recommendations for the structural design of final concrete linings for tunnels and underground stations for mass transit use that are based on ultimate strength concepts of concrete behavior and that take full advantage of interaction between the linings and ground. This report, Volume II, presents design recommendations for concrete tunnel linings for transportation tunnels. The recommendations developed as a result of in-depth analysis and model testing of the behavior of concrete tunnel linings. The research addressed problem areas in current design practice, and the authors point out that the results have provided insight into the areas of uncertainty that have led designers to gross overconservatism in tunnel lining design.

PB84-158484/GAA PC **A04**/MF **A01**
Monsanto Research Corp., Dayton, OH. Dayton Lab.
Physical Testing of Polymers for Use in Circulatory Assist Devices.
Final rept. 1 Sep 80-30 Sep 83,
C. R. McMillin. Jan 84, 71p* MRC-DA-1153
Contract NO1-HV-02909
See also PB83-126706.

Keywords: *Health, *Plastics, Polymers, Tests, Failure analysis, Copolymers, Fatigue(Materials), Mechanical properties, Durability.

The development of cardiac assist devices and other instrumentation and components which come in contact with the cardiovascular system requires materials which will perform in a physiological environment. One particularly difficult application is the diaphragm for blood pumps, which requires an elastomer to undergo cyclic deformation and/or flexing while in contact with blood. The objectives of this project were to develop short-term fatigue test methodologies that will predict long-term in-vitro performance of elastomers used in cardiac assist devices and to evaluate the fatigue life of candidate materials for potential use in circulatory assist devices. An accelerated fatigue test was developed and validated that employs an increasing cyclic strain applied to standard uniaxial tensile test specimens. The total time required to conduct this test is approximately one month. Shorter (more accelerated) tests were evaluated but were found not to correlate with longer term data. The specific test conditions appropriate for heart assist devices included a cyclic rate of 120 cycles per minute, 37 C, and increasing strain every 24 hours. Tests were conducted in a variety of media including air, saline, oxygen, nitrogen, ozone, and blood.

PB84-159805/GAA PC **A03**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
Longrun Changes in World Food Supply and Demand. Implications for Development Assistance Policy,
C. E. Hanrahan, F. S. Urban, and J. L. Deaton. Jan 84, 47p AGES-840111

Keywords: *Food, *International trade, Demand(Economics), Developing countries, Income, Prices, Imports, Population growth, Nutrition, Policies, Climate, Irrigation, Fertilizers, Investments.

A steady growth in food production in the developing countries since 1950 was accompanied by increased use of land and water resources and by the application of new technologies in agricultural production. Rapid population growth in the developing countries, growth in per capita income, relative stability of food prices--except during the 1970's--and government policies influenced world food demand. Malnutrition continues to be a problem for many vulnerable groups in the developing countries. U.S. development assistance policy should focus attention on the following: nutrition and other aspects of wellbeing in relation to U.S. security interests in developing countries, agricultural policies, development and dissemination of technology, and U.S. aid in relation to international lending programs.

PB84-160662/GAA PC **A05**/MF **A01**
National Marine Fisheries Service, Seattle, WA.
Marine Fisheries Review. Volume 45, Number 7-9, July-September 1983.
Sep 83, 89p NOAA-84022201
See also PB84-160670 through PB84-160753 and Volume 45, Number 4-5, PB83-258855.

Keywords: *Seafood, *Fisheries, *Fishes, Nomenclature, Proteins, Frozen food, Food storage, Nutritine value, Mammals, Aquatic animals, Crabs, Squids, Marine Fishes, California, Merchant ships, Minced fish.

Contents:
Toward an improved seafood nomenclature system;
Economic potential for utilizing minced fish in cooked sausage products;
Chemical composition and frozen storage stability of weakfish, cynoscion regalis;
Composition, nutritive value, and sensory attributes of fish sticks prepared from minced fish flesh fortified with textured soy proteins;
Processing technologies and their effects on microbiological properties, thermal processing efficiency, and yield of Blue Crab;
Incidental catch of marine mammals by foreign fishing vessels, 1978-81;
An economic appraisal of sail-assisted commercial fishing vessels in Hawaii;
Experimental squid jigging off the Washington Coast;
Weight Frequencies for Striped Marlin, Tetrapturus audax, caught off Southern California.

PB84-160829/GAA PC **A02**/MF **A01**
Instituto Tecnico de Capacitacion y Productividad, Guatemala City.
Harinas: Valor Nutritivo e Higiene en su Manejo y Conservacion (Flours: Nutritive Value and Hygiene in Their Handling and Storage).
c1980, 25p INTECAP-81-005
Text in Spanish.

Keywords: *Food, *Food processing, *Sanitation, Manuals, Nutritive value, Cereal products.

This handbook is a compilation of class-notes aimed at giving some printing material to participants in a flour handling course. It includes the topics taught in that course plus supplementary knowledge on nutritive value and proper handling of farinaceous products.

PB84-160837/GAA PC **A03**/MF **A01**
Instituto Tecnico de Capacitacion y Productividad, Guatemala City.
Manual de Carnes (Meat Handbook).
c1980, 30p INTECAP-81-004
Text in Spanish.

Keywords: *Nutrition, *Sanitation, *Food processing, Handbooks, Food inspection, Nutritive value.

A compilation of class-notes was made in order to have this handbook, aimed mainly at giving some printed material to participants in meat handling and meat hygiene introductory courses. One half of these notes provide basic information on nutrition and the nutritive value of meat, and the rest is basic knowledge on meat hygiene and handling in slaughterhouses or meat stores.

PB84-161272/GAA PC **E03**/MF **E03**
Transport and Road Research Lab., Crowthorne (England).
High Performance Surface Dressing: 3. Properties of Thermosetting Binders Related to Road Performance.
Supplementary rept.,
J. H. Denning, and J. Carswell. c1983, 24p TRRL-SUPPLEMENTARY-798
See also PB-301 079.

Keywords: *Pavements, Epoxy resins, Additives, Skin resistance, Wear resistance, Bonding strength, Tensile strength, Viscoelasticity.

New surface dressing binders are being developed for surface dressing difficult road sites to provide a high resistance to skidding where vehicles turn or brake. The performance in road experiments of seven binders, containing between 13 and 50 percent epoxy-resin, has already been reported. This report describes the dynamic viscoelastic properties, and ultimate tensile strength and elongation at break of each binder at temperatures between 0 and 60 degrees C. A reasonable correlation has been found between these properties and the performance of the binders in the road experiments. A laboratory test in which small areas of surface dressing were trafficked by a pneumatic tire, is also described. A reasonable correlation has also been found between this test and road performance. (Copyright (c) Crown Copyright 1983).

PB84-161546/GAA PC **A07**/MF **A01**
Regional Services Corp., Inc., Columbus, IN.
Landfill Research at the Boone County Field Site.
Final rept.,
R. J. Wigh. Feb 84, 127p EPA-600/2-84-050

Keywords: *Waste disposal, *Environmental impacts, Field tests, Leaching, Sites, *Soils.

Sanitary landfills presently play a significant role in the disposal of solid wastes, and they will probably continue to do so in many areas because of their economic advantages over other methods. However, justifiable concern exists about the environmental effects of sanitary landfills. The research project described here was undertaken to provide a better understanding of the processes that occur within a sanitary landfill and the related environmental effects. The initial field-scale test cell was completed in June 1971 and was monitored for temperature, gas composition, settlement, and leachate quantity and characteristics until closure in September 1980. This report presents the results of the analysis of the data collected from the batch-type cells during the nine year monitoring period.

PB84-161652/GAA PC **A02**/MF **A01**
Johns Hopkins Univ., Baltimore, MD.
Studies in Port Facilities and Urban Economic Development: Executive Summary,
A. C. Goodman, D. L. Puryear, and D. Lenz. Dec 83, 5p DOT-RSPA-DMA-50-84/11
Contract DTRS56-81-C-00018
See also PB84-149947, and PB84-161660.

Keywords: *Ports, *Urban planning, *Economic development, Services, United States, Exports, Coal, Economic impact, Policies, Mid-Atlantic Region(United States), Input output analysis.

This study considers the demand for port services, their related economic impacts, and the policy responses that can be considered, with special emphasis on ports in the Middle-Atlantic region. The demand for port services is largely related to the demand for goods that go through the port. In this respect, specific attention is devoted to estimating the world demand for U.S. export coal, a commodity that led to major port bottlenecks in 1980 and 1981.

PB84-161702/GAA PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Dairy Program Alternatives for the 1980's.
Staff rept.,
L. E. Salathe. Feb 84, 45p AGES-840110

Keywords: *Dairies, *Food, *Agricultural economics, *Milk, Food consumption, National government, Cost analysis, Supply(Economics), Exports, Income.

About 10 percent more milk is produced than is needed to balance supply and demand. Annual dairy program costs total over $2.2 billion and CCC stocks are in excess of 15 percent of annual commercial disappearance. These factors have led to pressure to change the dairy price support program, but there appears to be little agreement as to specific changes. This paper analyzes the effects of 17 potential dairy program options on farmers, consumers, and taxpayers. The results provide a basis upon which policymakers, consumers, and farmers can systematically evaluate various dairy program proposals.

PB84-161926/GAA PC **A04**/MF **A01**
General Accounting Office, Washington, DC. National Security and International Affairs Div.
Meeting a Basic Human Need: AID'S Rural Potable Water and Sanitation Program.
21 Feb 84, 71p GAO/NSIAD-84-34, B-211720

Keywords: *Potable water, *Sanitation, *Water pollution, *Project planning, Technical assistance, Rural areas, Improvement, Water supply, Water pollution control, Grants, Public health, Water distribution, Irrigation, Malawi, Ecuador, Indonesia, Peru, Tanzania, Recommendations.

This report presents the results of GAO's review of AID's potable water and sanitation activities in Ecuador, Indonesia, Malawi, Peru and Tanzania. The report contains recommendations.

PB84-162122/GAA PC **A10**/MF **A01**
MITRE Corp., McLean, VA. METREK Div.
Integrated Aquatic Weed Management: Principles and Applications for Reservoirs in the Southeastern United States.
Final rept.,
R. W. Tyndall, P. N. Trudeau, D. V. Aurand, and D. L. Smith. Mar 82, 205p MTR-81W136
Contract EPA-68-02-3196

Keywords: *Aquatic plants, *Weed control, Lakes, Reservoirs, Ecology, Management, Cost analysis, Environmental impacts, Agricultural machinery, Herbicides, Drawdown, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana.

The objective of this manual is to provide aquatic weed managers in the United States with suggestions for implementing a holistic, systems approach to solving aquatic weed problems. This approach is based upon the successes of the Integrated Pest Management philosophy of agricultural pest management and is therefore referred to as Integrated Aquatic Weed Management, or IAWM. These guidelines are based upon the principles of IAWM and the best technology known to be available for managing aquatic weeds in South Carolina, Georgia, Florida, Alabama, Mississippi, and Louisiana. Hypothetical management plans have been prepared for reservoir ecosystems in the southeastern United States with unacceptable levels of Eurasian watermilfoil (Myriophyllum spicatum) or hydrilla (Hydrilla verticillata). Procedures for implementing each strategy are described as well as potential environmental impacts, costs, and monitoring criteria for strategy revision.

PB84-162148/GAA PC **A24**/MF **A01**
National Research Council, Washington, DC.
Poundage Update of Food Chemicals, 1982.
Final rept.
31 Jan 84, 575p
Contract FDA-223-80-0043
See also PB-221949, and PB80-113418.

Keywords: *Food, *Food processing, Surveys, Tables(Data), Poundage.

The report is a survey of the food industry on the poundages of food additives used in 1982. The poundages are presented as totals and matched to previous surveys.

PB84-162379/GAA PC **A03**/MF **A01**
Georgia Tech Research Inst., Atlanta.
Prosthetic Heart Valves: A Study of In Vitro Performance. Phase 2, Part 1.
Final rept. 1 Oct 81-30 Nov 83,
A. P. Yoganathan. 30 Nov 83, 42p* HHS/PUB/FDA-84-4170, , FDA/NCDRH-84/30
Contract DHHS-223-81-5000
See also PB84-162387.

Keywords: *Prosthetics, *Health, Performance evaluation, In vitro analysis, Fluid dynamics.

The following report is a detailed experimental study of the in vitro fluid dynamic characteristics of different designs of prosthetic heart valves in current clinical use. It should, however, be noted that due to the limitations of time and money not all the questions regarding the fluid dynamic performance of a given valve design could be answered. Since it is anticipated that the report will be read by scientists, engineers, and physicians, the report has been written in three parts. Part I summarizes the in vitro fluid dynamic characteristics of each valve design (i.e., the experimental results), and attempts to relate these results to possible clinical and pathologic problems. No comparisons are, however, made between the different valve designs.

PB84-162387/GAA PC **A04**/MF **A01**
Georgia Tech Research Inst., Atlanta.
Prosthetic Heart Valves: A Study of In Vitro Performance. Phase 2, Part 2.
Final rept. 1 Oct 81-30 Nov 83,
A. P. Yoganathan. 30 Nov 83, 59p* HHS/PUB/FDA-84-4171, , FDA/NCDRH-84/31
Contract DHHS-223-81-5000
See also PB84-162379 and PB84-162395.

Keywords: *Prosthetics, *Health, Performance evaluation, In vitro analysis, Fluid dynamics.

The following report is a detailed experimental study of the in vitro fluid dynamic characteristics of different designs of prosthetic heart valves in current clinical use. The study was conducted under FDA Contract No. 223-81-5000, which lasted approximately 2 years. It should, however, be noted that due to the limitations of time and money not all the questions regarding the fluid dynamic performance of a given valve design could be answered. Since it is anticipated that the report will be read by scientists, engineers, and physicians, the report has been written in three parts. Part II contains the details of the experimental equipment and techniques used during the study.

PB84-162395/GAA PC **A12**/MF **A01**
Georgia Tech Research Inst., Atlanta.
Prosthetic Heart Valves: A Study of In Vitro Performance. Phase 2, Part 3.
Final rept. 1 Oct 81-30 Nov 83,
A. P. Yoganathan. 30 Nov 83, 268p* HHS/PUB/FDA-84-4172, , FDA/NCDRH-84/32
Contract DHHS-223-81-4172
See also PB84-162387.

Keywords: *Prosthetics, *Health, Performance evaluation, In vitro analysis, Fluid dynamics.

The following report is a detailed experimental study of the in vitro fluid dynamic characteristics of different designs of prosthetic heart valves in current clinical use. The study was conducted under FDA Contract No. 223-81-5000, which lasted approximately 2 years. It should, however, be noted that due to the limitations of time and money not all the questions regarding the fluid dynamic performance of a given valve design could be answered. Since it is anticipated that the report will be read by scientists, engineers, and physicians, the report has been written in three parts. Part III contains the detailed experimental data in graphical, tabular and/or photographic forms. All the chapters, pages, figures, and tables are consecutively numbered in numerical order.

PB84-163187/GAA PC **E04**/MF **E04**
Transport and Road Research Lab., Crowthorne (England).
Performance of Unsealed Roads in Ghana,
P. W. D. H. Roberts. c1983, 47p TRRL-LR-1093

Keywords: *Roads, *Ghana, *Maintenance, Performance, Grading(Earthworking), Developing countries, Surface roughness.

A study has been made in Ghana of the effect of road maintenance on road performance. This report gives the results of measurements of the condition of unsealed roads made over a period of more than two years. The effects of the maintenance activities of grading and dragging on road surface conditions are assessed. During the study some of the running surfaces deteriorated sufficiently to significantly increase road user costs. Roughness was the aspect of running surface condition which had most effect on vehicle running costs. (Copyright (c) Crown Copyright 1983.)

PB84-163864/GAA PC **A06**/MF **A01**
New York Sea Grant Inst., Albany.
Seaweed Raft and Farm Design in the United States and China,
L. B. McKay. 1983, 108p NOAA-84022704
Sponsored in part by New York State Energy Research and Development Authority, New York, Gas Research Inst., Chicago, IL., and New York Gas Group, NY.

Keywords: *Aquaculture, *Farming, Design, *Algae, Inland waterways, Cultivation, Substrates, Rivers, New York, Biomass, Life cycles, Anchoring, Nets, China, United States, Gracilaria.

Contents:
- Pilot-scale mariculture of seaweeds in Washington;
- Experimental-scale raft culture of marine macroalgae in inland marine waters;
- Macroalgal culture in California and China;
- Land-based cultivation of seaweeds:
- an assessment of their potential yields for 'energy farming';
- A design for energy-independent seaweed raft culture in tidal creeks and rivers;
- The New York State marine biomass program.

PB84-164235/GAA PC **E04**/MF **E04**
Transport and Road Research Lab., Crowthorne (England).
Specialised Bus Services in Three Third World Cities.
Supplementary rept.,
D. A. C. Maunder, and P. R. Fouracre. c1983, 27p TRRL-SUPPLEMENTARY-811

Keywords: *Buses(Vehicles), *Transportation, Urban areas, India, Thailand, Travel patterns, Services, Socioeconomic status, Residential areas.

In recent years operators of public transport bus services in Third World cities have increased their operation of dual services. As well as ordinary stage-carriage services, specialized services (providing, for example, more speed and comfort) are operated mainly on high demand corridors or to middle-income residential areas. The report describes the operational characteristics of specialized bus services in two Indian cities, Hyderabad and Delhi, and in Bangkok, Thailand. In addition, socio-economic characteristics and trip details of passengers are examined and an assessment made of the extent to which the services meet the objectives expected of them. It is possible that dual services, such as those described, may become the normal operating system of the future in most Third World cities. A basic and inexpensive ordinary service can be operated for low income users and a more expensive service operated for middle income users who can better afford the cost of higher quality. (Copyright (c) Crown Copyright 1983.)

PB84-165455/GAA PC **A03**/MF **A01**
Universidad de los Andes, Bogota (Colombia). Centro de Estudios e Investigacion.
Racionalizacion del Uso de Energia en las Futuras Edificaciones Colombianas (Rationalization of Energy Use in Future Colombian Buildings),
A. V. Suarez. 1982, 43p I-1
Text in Spanish.

Keywords: *Buildings, *Colombia, *Energy management, Architecture, Engineering, Design, *Construction, Developing countries, Developing country application, Energy conservation, Bogota(Columbia).

This study on the rationalization of energy use in Colombia begins with some standards of energy consumption in the United States and presents some aspects of the relationship between engineering and architecture there. It then reviews the work on this subject which has been done in Colombia, and points out areas where work needs to be done. It also indicates some aspects which should be analyzed and regulated concerning design and construction. The report then shows a practical example of rationalizing energy use in a Bogotan residence.

PB84-165463/GAA PC **A03**/MF **A01**
Universidad de los Andes, Bogota (Colombia). Centro de Estudios e Investigacion.
Introduccion al Analisis y Proyeccion de Series de Tiempo (Introduction to Analysis and Projection of Time Series),
I. Perez. 1982, 36p I-8
Text in Spanish.

Keywords: *Time series analysis, Mathematical prediction, Probability theory, Regression analysis, Stochastic processes, Decision making, Adaptive filters, Delphi technique, Box-Jenkins method, Developing country application.

This document provides some techniques (qualitative and quantitative) to predict the occurrence of future events and so diminish the uncertainty in prognostication and decision making. The techniques described use what is known as time series projection, based on tools of statistics such as probability and regression models. Time series models are constructed in accord with statistical phenomena which change with time and which are stochastic processes. Among the quantitative models described are simple regression, moving averages, additive models, and exponential smoothing. The qualitative ones are based on decisions of experts in the matter of prognostication and the principles are adaptive filters, the method of Box-Jenkins, and Delphi.

PB84-165513/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Manufacture of Laboratory Porcelain: Basic Information,
M. Novy, and S. Sabata. 23 Nov 83, 22p UNIDO/IO.566, V-83-64240

Keywords: *Porcelain, *Industrial plants, Manufacturing, Developing country application.

The paper deals with laboratory porcelain and its characteristic properties. The influence of individual body components as well as of some additional agents on its properties is described. The importance of proper firing course and the most used technological ways of the production, casting and forming by plaster molds are described, too. The description of liquefying process and examples of liquefying agents are presented together with the usability of single or double firing processes for various porcelain products.

PB84-165521/GAA PC **E12**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Organic Wastes for Fuel and Fertilizer in Developing Countries,
C. G. Golueke, and L. F. Diaz. 18 Feb 81, 288p UNIDO/IO.410, V-81-21829

Keywords: *Fertilizers, *Fuels, *Waste disposal, Hydrolysis, Ethyl alcohol, Proteins, Marketing, Pyrolysis, Biomass, Urban areas, Environmental surveys, Public health, Biogas process, Energy recovery, Developing country application.

Expert report on solid organic waste utilization for fuel and fertilizer in developing countries - covers (1) nature of solid waste; importance of a sound waste disposal programme; resource recycling aspects (2) determining quantity and composition of waste output (3) use of organic matter as a fertilizer (4) composting (5) hydrolysis and single cell protein ethanol production (6) waste as an energy source: survey of methods (7) biogasification (8) thermal recovery of energy. Statistics, diagrams, bibliographies. Additional references: urban areas, biomass, public health service, environment, choice of technology, pyrolysis, marketing.

PB84-165539/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Wooden Packaging for Fruit and Vegetable Products,
D. Castelli. 22 Nov 83, 55p UNIDO-ID/WG.369/13, V-83-64172

Keywords: *Fruits, *Vegetables, *Packaging, *Containers, *Wood, Boxes(Containers), Assembling, Drawings, Developing country application.

The report covers the preparation of parts and final assembly of finished containers; preparation of bottoms; automatic conveyor belt type stitcher; preparation of lids; assembly of packaging containers and industrial products packaging; pallets; automatic stitching line. Diagrams and additional references are included.

PB84-165547/GAA PC **A23**/MF **A01**
Universidad de los Andes, Bogota (Colombia). Centro de Estudios sobre Desarrollo Economico.
Balance Energetico Rural de Colombia y su Contexto Socioeconomico 1981 (Rural Energy Balance of Colombia and Its Socioeconomic Context 1981),
J. E. Torres. Nov 82, 534p
Text in Spanish.

Keywords: *Energy, *Energy management, *Rural areas, Agriculture, *Colombia, Developing country application.

This report discusses the methodology used and results obtained from a two-year study of the energy behavior of family and production units in rural Colombia. It gives a brief outline of a theoretical discussion of methodology and then an analysis of the use of energy in a sociocultural, economic, and technological context in rural areas. The methodology used to select the sample of family and productive units is given as is the criteria in the design of the questionnaire. Then the results are given for the study of 2,018 homes, extrapolated for six different energy regions. Energy consumption for agricultural and agroindustrial activities is given for eleven cultivations, including coffee. Rural industry is scarce, mostly the production of mud bricks and tiles. The study confirms the importance of petroleum derivatives to agriculture in Colombia. All the above information is recapitulated in a countrywide conclusion.

PB84-165554/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Alternative Agricultural Pricing Policies in Egypt,
S. Nassar, and S. Imam. May 83, 33p UCD/ADS/EWP-169
Contract AID-263-0041
Prepared in cooperation with Fayoum Univ. (Egypt) and Zagazig Univ. (Egypt).

Keywords: *Crops, *Agricultural economics, *Egypt, Production, Farm crops, Allocations, Statistical analysis, Cotton, Corn, Rice, Sugarcane, Supply(Economics), Developing country application.

Government-controlled low agricultural prices discourage farmer productivity, result in inefficient resource allocation, and depress the agricultural sector relative to other sectors of the economy. Price distortions have made cotton, rice, lentil, sesame, lemon, and bean production unprofitable, while favorable livestock prices have encouraged feed and fodder production, including wheat for straw. Normative prices for Egyptian crops were calculated by several alternative methods and then compared statistically with actual prices received.

PB84-165562/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Construction of Shipbuilding and Shiprepair Yards for Small-Scale Ships,
B. K. Mazurkiewicz. 4 Feb 83, 9p ID/WG.375/37, V-83-51152

Keywords: *Ports, *Construction, *Building materials, Buildings, Construction materials, Developing country application.

This paper discusses the considerations to be taken before constructing a boat yard. The main points covered are determining the type of boat to be built or services, siting the yard, deciding the materials to be used (ferrocement or wood or metal), the buildings required, and the launching and docking facilities.

PB84-165588/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Glassfibre Reinforced Cement Used in the Boatbuilding,
N. Roos. 4 Feb 83, 9p ID/WG.375/38, V-83-51153

Keywords: *Cement, *Boats, Fiberglass, Composites, Developing country application.

This report explains how to use glassfibre reinforced cement to build watertight; rot, insect, and corrosion resistant, fire resistant, easily repaired, low cost boats. It covers techniques, costs, and the training of workers.

PB84-165596/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Manufacture of High Alumina Products: Basic Information,
F. Capurka, and M. Novy. 23 Nov 83, 17p UNIDO/IO.565, V-83-64241

Keywords: *Aluminim, *Metals, Refractories, Manufacturing, Bricks, Grog, Developing country application.

The report presents the main principles of the manufacture of high alumina refractories usable at temperatures 1700 - 1800 degree C. The classification and characteristics of high alumina products are also presented. The production of each type of grog is described from initial raw materials, including the applied equipment, to properties of various grogs and advantages of some productions. The process of crushing and grinding of grogs is mentioned as well as the production of special bricks starting from mixing and composition of working blends to firing in kilns. Finally, the characteristic qualities of high alumina bricks are presented.

PB84-165687/GAA PC **A10**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.
Instructivo para Diseno Estructural de Pavimentos Flexibles para Carreteras (Manual of Structural Design Criteria for Flexible Roads),
S. Corro, R. Magallanes, and G. Prado. Nov 81, 209p SER-444
Text in Spanish.

Keywords: *Roads, *Pavements, Highways, Guidelines, Tests, Loads(Forces), Mathematical models, Mexico, Developing country application, Computer aided design.

The Manual describes the structural design criteria for flexible roads developed at the Engineering Institute of the National Autonomous University of Mexico. The guidelines included have been validated through experimentation in test roads, typical highways in the network, and accelerated full-scale testing in the laboratory. General aspects of the theoretical model developed to predict the performance of multilayered systems under repeated loading are described. Guidelines to evaluate the design variables are presented. Examples for the practical application of the method are included, using three approaches: Graphical design; Design using programmable pocket calculators and Design through computer program.

PB84-165695/GAA PC **A04**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.
Concentradores Solares (Solar Concentrators),
R. Almanza, A. Valdes, and S. Lopez. Jun 81, 57p SER-D-16
Text in Spanish. See also English version, PB82-157553.

Keywords: *Solar energy, Mirrors, Solar concentrators, Concentrating collectors.

This paper presents different types of geometries used in concentrators. Some comments are made on the theoretical and experimental analysis necessary to evaluate the geometries and on the type of laboratory equipment needed to obtain experimental data. At the end of the report a description of how to build parabolic trough mirrors is made. The experience gained by the authors, who have been working in this subject for the past five years, is summarized, showing some of the problems related with such concentrators.

PB84-165737/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Major Issues in Egyptian Water Policy,
W. E. Gustafson. Jul 83, 22p UCD/ADS/EWP-176
Contract AID-263-0041

Keywords: *Farming, *Water supply, *Egypt, *Irrigation, Drainage, Water consumption, Constraints, Decision making, Pumping, Water distribution, Shortages, Developing country application.

After reviewing the literature on irrigation, drainage, and land reclamation in Egypt, the author offered comments about what he saw as major issues. (A bibliography of recent literature is attached). The main theme that struck him in his reading was ignorance--lack of knowledge about how much water farmers actually use, for example. Water policy is currently being made in a knowledge vacuum. There seems to be an undertone that the water supply system should somehow determine what the farmer does (as decided by policy makers) rather than being responsive to what he does.

PB84-165844/GAA PC **A06**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.
Investigacion Cientifica y Necesidades Basicas de la Poblacion: Un Metodo de Evaluacion de Proyectos (Scientific Research and Basic Needs of Population: Method for Project Evaluation),
F. Lara, and L. Aragon. Oct 81, 104p SER-442
Text in Spanish.

Keywords: *Research and development, *Technology transfer, Requirements, Populations, Sanitary engineering, Developing country application.

A method is proposed that permits assessing research projects according to their impact upon the satisfaction of basic needs of the marginal population. Two kinds of impacts are considered; direct effects, when the research problem has a straight-forward relationship with basic needs, and indirect effects, when the research project helps to develop a specific scientific area that can introduce new solutions to basic needs. In a first appendix the research procedure is presented. In a second appendix a general view of the marginality problem is given, to serve as a social reference framework to the project.

PB84-165851/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Input Price Mechanism in Relation to Current Market Constraints,
R. E. Emarah, E. Abou-El-Wafa, and G. El-Malaaha.
May 83, 25p UCD/ADS/EWP-147
Contract AID-263-0041
Prepared in cooperation with Cairo Univ., Giza (Egypt) and Alexandria Univ. (Egypt).

Keywords: *Agricultural economics, *Egypt, Prices, Grants, *Marketing, Output, Fertilizers, Pesticides, Constraints, Government policies, Developing country application.

Under the objective of the Egyptian government to increase aggregate agricultural supply, various policies have been followed at various times, subsidizing either or both input and output prices. The paper examined in particular the government's subsidization of fertilizer and pesticides prices. In spite of these input subsidies, the gap between what is available and what is needed has increased sharply over time. The government should attempt policies other than those in use.

PB84-165901/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Food Consumption and Decision-Making in Egypt,
A. I. Abdou. Oct 82, 11p UCD/ADS/EWP-102
Contract AID-263-0041
Prepared in cooperation with National Research Center, Cairo (Egypt).

Keywords: *Farming, *Crops, *Food supply, *Egypt, Production, Humans, Prices, Feeding stuffs, Livestock, Vegetables, Incentives, Cost control, Developing country application.

Because of the existing and ever-worsening food crisis in Egypt, farmers are expected to devote production to major staples for human consumption. But price signals in the economy are not encouraging them to do so. The paper investigates farmers' motivations for raising livestock feed and nonstaple cash crops, especially vegetables instead of basic traditional crops. If the situation is to be remedied, economic incentives must be altered. Administrative prices of basic grains must be raised so farmers will be more inclined to grow them.

PB84-165919/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
So You Want to Build a Chlor-Alkali Plant,
J. D. Adhia. 6 Dec 83, 21p UNIDO/IO.567, V-83-64925

Keywords: *Chemical industry, *Industrial development, *Industrial plants, Design criteria, Performance evaluation, Trends, Utilization, Technology, Manufacturing, Developing country application.

UNIDO pub on factory establishment for production of chlorine and caustic soda - (1) covers development background, uses and trends in manufacture of such chemicals; demand in developing countries; choice of technology (2) provides guidance in the selection of appropriate technology and production capacity for small scale chlor-alkali plants. Bibliography, flow charts. Additional reference: salt.

PB84-165927/GAA PC **A04**/MF **A01**
Universidad de los Andes, Bogota (Colombia). Centro de Estudios e Investigacion.
Condensadores en los Sistemas de Potencia (Condensers in Power Systems),
A. Torres. 1982, 51p I-4
Text in Spanish.

Keywords: *Power equipment, Design, Developing country application, Power systems.

This report establishes concepts and criteria for the design of condenser banks and the conditions which should help prevent breakdowns. The first part refers to common practices in the disposition and connection of the banks, with special attention to the connection of the neutral. The second part covers transitory problems of the energization and deenergizations of condenser banks, which depends mostly on the configuration and form of the connection, including an analysis of the ground of the bank, with non-lineal resistance of zinc-oxide. The third part revises the philosophy of protection of condenser banks, the most common practices, and the setting of concepts which carry the elaboration of practical recommendations on how to protect these elements in a power system. This includes some techniques for the detection of failures and for avoiding the rupture of tanks of the condensers which can cause major failures. It also presents some considerations and criteria to take into account for designing of condenser banks.

PB84-166222/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Production and Market Situation for the Food-Processing Industry with Special Emphasis on Vegetable Oils and Fats.
3 Oct 83, 63p UNIDO-ID/WG.404/3, V-83-62382

Keywords: *Marketing, *Vegetable oils, *Food processing, *Egypt, *International trade, Beverages, Tobacco, Production, Employment, Meat, Dairy products, Fruits, Fisheries, Feeding stuffs, Oilseed crops, Food consumption, Industries, Developing country application.

Contents:
- Production and market situation for the food-processing industry;
- Production and market situation for vegetable oils and fats industry.

PB84-166248/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Seminar on National Self-Reliance in Blood and Blood Fractions for Developing Countries, Stockholm, Sweden, 27 September - 1 October 1982.
28 Oct 83, 32p UNIDO/IO.562, V-83-63357

Keywords: *Health, Humans, Blood transfusion, Plans, Developing country application, Fractionation, *Health services.

Contents: Introduction; Organization of the meeting; Adoption of the agenda precis of the seminar; A country-wide whole blood transfusion; Preparation for hemotherapy; The use of human blood and blood substitutes; Blood plasma fractionation; Strategy for national or regional self-reliance in blood derivatives; Plan of action.

PB84-166495/GAA PC **A05**/MF **A01**
Michigan State Univ., East Lansing. Dept. of Crop and Soil Sciences.
Development of Test for Determining Anaerobic Biodegradation Potential.
Rept. for Sep 79-Sep 81,
D. R. Shelton, and J. M. Tiedje. Sep 81, 92p EPA-560/5-81-013
Contract EPA-68-01-5043

Keywords: *Environmental surveys, Solid waste disposal, Industrial wastes, Metabolism, Oxidation reduction reactions, Sampling, *Toxic substances, Sewage sludge, Gas production rates.

This project was for the purpose of developing and evaluating a suitable screening-level laboratory method for the evaluation of the potential that an organic compound might be susceptible to anaerobic biodegradation (methanogenesis) in the environment. As it developed, the project focused on a method under consideration by the American Society for Testing and Materials (ASTM) and the report contains several recommendations as appropriate, for the modification of the draft ASTM method. Overall, the report, with the recommended modifications, consists of a single-lab validation of the basic method. The method also appears as one of the EPA Office of Toxic Substances Chemical Fate Test Guidelines. In the method, a chemically defined anaerobic medium containing resazurin, as an oxidation/reduction indicator, and 10 primary anaerobic digestor sludge are dispensed in 100-mL portions into serum bottles. Selected bottles are supplemented with test substance at a concentration equivalent to 50 mg/L as organic carbon. Gas production is measured at appropriate intervals. The extent of biodegradation is determined by comparing gas production from blank control bottles and bottles containing the test substance.

PB84-166867/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Constant Technical Relationships between Inputs and Outputs in the Native Hatchery Industry,
Y. Mohieldin, W. M. Afify, and I. S. Aly. Apr 83, 13p UCD/ADS/EWP-131
Contract AID-263-0041
Prepared in cooperation with Ministry of Agriculture, Cairo (Egypt) and Menofia Univ. (Egypt).

Keywords: *Poultry, *Egypt, Operations, Production, Industries, Regression analysis, Chickens, Tables(Data), Developing country application, Hatcheries.

Eggs, an important source of animal protein, are allocated to the fresh market, bakeries, and hatcheries. Hatcheries in Egypt are of two types: (1) indigenous, traditional hatcheries with small flocks and (2) large commercial operations of which there were more than 1400 in 1979. Both types of production operations are described in the paper and a regression analysis was performed to predict the percentage hatched: the number of hatched chicks on an annual basis (Y) was seen as a linear function of the number of eggs set that year (X). Obviously, when X is zero, so is Y, so the intercept was suppressed. Equations were filled for Egyptian hatcheries aggregated, for indigenous hatcheries, and for commercial hatcheries.

PB84-166875/GAA PC **A04**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Economic Indicators of Efficiency of the Egyptian Cotton Spinning Industry,
H. Khedr, H. Kheir El-Din, and E. Monke. Dec 82, 55p UCD/ADS/EWP-104
Contract AID-263-0041
Prepared in cooperation with Ministry of Agriculture, Cairo (Egypt), Cairo Univ., Giza (Egypt) and Arizona Univ., Tucson.

Keywords: *Cotton, *Egypt, Spinning(Staple fibers), Industries, Exports, Cotton spun yarns, Profits, Developing country application.

Egyptian long-staple cotton which is exported at a relatively high price and is used by importing countries to spin a fine yarn, has been increasingly used domestically to spin coarse and medium yarns which are then used domestically or exported. The paper investigates the economic efficiency of the Egyptian spinning industry, including this apparently inefficient practice of substituting yarn for raw cotton in the export trade.

PB84-166883/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Socio-Economic Activities of Land Reclamation Cooperatives in Egypt,
A. H. A. Sharshar. May 83, 23p UCD/ADS/EWP-148
Contract AID-263-0041
Prepared in cooperation with Al Azhar Univ., Cairo (Egypt), and Egyptian Ministry of Agriculture, Cairo (Egypt).

Keywords: *Land use, *Marketing, *Agricultural economics, *Egypt, Land reclamation, Socioeconomic status, Economic factors, Performance evaluation, Efficiency, Developing country application, *Cooperatives.

The paper is one of several assessing the role and performance of agricultural cooperatives in Egypt. The increase in reclaimed agricultural land in Egypt has required a special type of cooperative; the members receive and farm parcels under cooperative management. Most of these land reclamation cooperatives are located in Upper Egypt; their average size is under 1000 feddans. The paper describes the structure and the social and economic activities carried out by the cooperatives. Evaluation of their efficiency and performance from the member's point of view is still needed.

PB84-166941/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Summary and Proceedings of ADS (Agricultural Development Systems) Economics Policy Workshop (10th) -'Labor Migration and Egyptian Agriculture'.
May 83, 13p UCD/ADS/EWP-153
Contract AID-263-0041

Keywords: *Agricultural economics, *Migration, *Egypt, California, Project planning, Policies, ADS Egypt-California Project, Developing country application.

The Tenth ADS Economics Policy Workshop, held in May 1983, explored policy issues surrounding domestic and international labor migration and the development of Egyptian agriculture. Papers and discussion focused on migration within Egypt and abroad, the impact of migration on labor supply, the utilization of remittances, other countries' experiences with labor migration, and implications for agricultural development policies.

PB84-167139/GAA PC **A18**/MF **A01**
IOX Assessment Associates, Culver City, CA.
Evaluation Handbook for Health Education Programs in Alcohol and Substance Abuse.
Sep 83, 413p*
Contract PHS-200-81-0622

Keywords: *Alcoholism, *Project planning, Handbooks, Evaluation, Education, Attitudes, Tests, *Health education.

In recent years health educators have increasingly recognized that systematic evaluation can help them appraise and improve their programs. For this potential to be realized, however, effective mechanisms for gathering relevant data are required. Until now, there have been instances where critical information about a program's effects has not been collected because of a lack of suitable measures for gauging program effects. The purpose of this handbook is to rectify, at least in part, this deficiency in the evaluation of health education programs in alcohol and substance abuse. The handbook is not intended to be prescriptive or all-inclusive. Those who evaluate alcohol and substance abuse programs should regard the handbook only as a resource, that is, a collection of assessment tools which may be of use.

PB84-167170/GAA PC **E04**/MF **E01**
Swedish Council for Building Research, Stockholm.
Corrugated Sheets of Natural Fibre Reinforced Concrete: Draft Standard,
L. Johansson. 1984, 42p D3:1984, ISBN-91-540-4055-8

Keywords: *Reinforced concrete, *Houses, Mechanical properties, Developing countries, Water stain tests, Standards, Life tests.

In conjunction with housebuilding in developing countries, construction of roofs poses a considerable problem. The difficulty lies in finding a roofing material which is light in weight and has high strength, and also has a long life in the prevailing climate. It must also be possible for this material to be produced with the least possible expenditure of capital. The object of this work is to present a draft standard for test methods for corrugated sheets made of natural fibre concrete, to be used in developing countries, and to produce and test a number of sheets in conformity with this draft standard. This investigation is a diploma work at the Department of Building Construction, Royal Institute of Technology, Stockholm.

PB84-167378/GAA PC **E04**/MF **E04**
Transport and Road Research Lab., Crowthorne (England).
Road Accidents in Developing Countries,
G. D. Jacobs, and I. A. Sayer. c1983, 29p TRRL-SUPPLEMENTARY-807

Keywords: *Road transportation, *Motor vehicles, Traffic safety, Problem solving, *Roads, Accident causes.

By the early 1970's countries of the Third World were becoming increasingly aware that they faced a growing road safety problem. In 1972, following numerous requests made by developing countries for aid and guidance in the road safety field, a small research team was formed within the Overseas Unit of the Transport and Road Research Laboratory. The aim of this team was to undertake research in Third World countries with a view to establishing the nature and extent of their traffic accident problems and, in the longer term to assess the effectiveness of remedial measures. This paper describes some of the major findings of this research team. (Copyright (c) Crown Copyright 1983.)

PB84-167535/GAA PC **A04**/MF **A01**
Foreign Agricultural Service, Washington, DC.
Horticultural Products - Tropical Fruit and Products Trade Statistics in Selected Countries.
Foreign agriculture circular.
Feb 84, 58p CIRC SUPPL-3-84

Keywords: *Tropical regions, *Fruits, *International trade, Exports, Imports, Commodities, Statistical data, Global, Mangos, Avocados, Bananas.

Fresh and processed products covered in this publication include avocados, bananas, cashew apples, guaves, kiwifruit (Chinese gooseberries), mangoes, mangosteens, papayas, pineapples, plantains and tamarinds. Trade Statistics are limited to major exporting and importing countries and include all of the above commodities. World trade in fresh and processed tropical fruit products has remained fairly stable in recent years. The US continues to be a significant factor in this commerce, both as an exporter and as an importer, although US imports far outweigh exports of these products.

PB84-167550/GAA PC **E10**/MF **E01**
Swedish Council for Building Research, Stockholm.
Traditional Tswana Housing: A Study in Four Villages in Eastern Botswana,
A. Larsson, and V. Larsson. 1984, 207p D7:1984, ISBN-91-540-4069-8

Keywords: *Housing, *Botswana, *Houses, Layout, Walls, Mud, Construction, Villages, Households.

The aim of the study is to present the first documentation of traditional Tswana housing in Botswana today. The layout of the dwelling, the use of space and the building methods are the main interests. The report is descriptive. It describes where and how different domestic activities are carried out along with how houses are built. People's attitudes and their desires for changes are only briefly covered.

PB84-167568/GAA PC **E08**/MF **E01**
Swedish Council for Building Research, Stockholm.
Public Management Structures for Land Use and Settlement Systems - a Survey of Knowledge Based on Swedish Research,
C. Lindgren, K. Lindgren, and A. Sahlin. 1984, 167p D1:1984, ISBN-91-540-4051-5

Keywords: *Land use, *Urban planning, *Regional planning, Government, Management, Citizen participation, Decision making, Coordination, Communities, Sweden.

This report deals with the public management used in Sweden for urban and regional planning. It shows how the management structures have developed and describes their results from a research point of view. The public management structures have changed markedly from the 1950s to the present day, partly with regard to the organizational structure which has developed in a direction towards a smaller number of larger units and partly with regard to the planning structure in which the number of planning forms and rules has increased. The management structures constituted one of the aids which enabled Sweden to achieve what is, perhaps, the highest material living standard in the world with regard to built-up areas.

PB84-167592/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Egypt's Agrarian Reform Cooperatives,
M. R. El-Shohnah. Jun 83, 34p UCD/ADS/EWP-175
Contract AID-263-0041
Prepared in cooperation with Cairo Univ., Giza (Egypt).

Keywords: *Marketing, *Agricultural economics, *Egypt, Credit, Market research, Services, Pest control, Irrigation, Harvesting, Plows, Surpluses, Earnings, Livestock, *Cooperatives.

This economic study of the agrarian reform cooperative in Egypt explains the need for cooperatives in areas characterized by inequitable distribution of land ownership and by rural poverty. The evolution of agrarian reform cooperative legislation from its initiation in 1952 through the most recent law in 1980 was examined. The various types of cooperative structure were explained as was their relationship to other cooperatives in Egypt. Extension of credit, marketing services, mechanical services (plowing, threshing, irrigation, and pest control), and distribution of livestock were discussed as critical provisions of a cooperative to its members.

PB84-167758/GAA PC **A23**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Wind and Seismic Effects. Proceedings of the Joint Panel Conference of the U.S.-Japan Cooperative Program in Natural Resources (12th) Held at Gaithersburg, Maryland on May 19-23, 1980.
E. V. Leyendecker, and R. M. Chung. Jan 84, 549p*
NBS-SP-665
See also PB83-252791. Library of Congress catalog card no. 83-600593.

Keywords: *Bridges, *Buildings, *Earthquakes, *Wind pressure, Seismic waves, Gust loads, Earth movements, Dynamic structural analysis, Dynamic loads, Dynamic response, Soil mechanics, Tsunamis, Earthquake engineering.

The Twelfth Joint Meeting of the U.S.-Japan Panel on Wind and Seismic Effects was held in Gaithersburg, Maryland on May 19-23, 1980. The proceedings of the Joint Meeting include the program, the formal resolutions, the Task Committee Reports, and the technical papers. The subjects covered in the papers include: (1) the characterization of seismic ground motion, (2) the characterization of natural wind and extreme wind records, (3) structural response to earthquake loading, (4) storm surge and tsunamis, (5) recent developments in seismic design criteria, (6) technical cooperation with developing countries, (7) earthquake hazard mitigation, and (8) structural response to wind loading.

PB84-167774/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Food Security and Agricultural Production Strategies under Risk in Egypt,
A. H. Sarris. Mar 83, 46p UCD/ADS/EWP-136
Contract AID-263-0041

Keywords: *Food, *Agricultural economics, *Egypt, Production, *International trade, Risk, Environmental impacts, Mathematical models, Grants, Developing country application.

To achieve 'food security' in a developing country, insurance against two sets of relatively independent sets of risks is needed--risks associated with the international market and those generated domestically, e.g., environmental factors. The paper addresses the possibility of improving food security for a country, even given unstable international markets, by an internal reallocation of resources, altering its exposure to international risk.

PB84-167782/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Historical Analysis of the Agricultural Cooperative Movement in Egypt: 1900-1982,
I. Moharrum. May 83, 23p UCD/ADS/EWP-156
Contract AID-263-0041
Prepared in cooperation with American Univ. in Cairo (Egypt).

Keywords: *Agricultural economics, *Egypt, National government, History, Government policies, Control, Developing country application, *Cooperatives.

The paper is part of the ADS project which aims to assess the role and performance of agricultural cooperatives in Egypt vis-a-vis national planning goals and stated interests of cooperative members at the local level. A historical description of the cooperative movement is given in two phases: the first encompasses the period from the origins of the cooperative movement in 1909 up to the 1952 Revolution; the second covers from 1952 to the present when the government took a much stronger role in controlling the movement.

PB84-167907/GAA PC **E04**/MF **E04**
National Joint Health and Safety Committee for the Water Service, London (England).
Safety Aspects of Storage, Handling and Use of Chlorine and Sulphur Dioxide.
Health and safety guidelines no. 4.
Apr 82, 54p ISBN-0-901090-48-4

Keywords: *Toxic substances, Toxicity, Personnel management, Industrial training, Protective clothing, Storage, Drums(Chemical engineering), Specifications, Materials handling, *Occupational safety and health, Health risks.

The Health and Safety at Work Act 1974 requires employers to conduct their undertakings without, so far as is reasonably practicable, risk to the health and safety of employees and others who may be affected by the work being done. The aim of this document is to give information on the common hazards associated with the use of chlorine and sulphur dioxide at installations in sufficient detail to be of assistance to those engaged in the operation and maintenance of such installation. It is also intended to assist those engaged in designing plants who should also approach other relevant sources of expertise as well. While both gases are potentially dangerous they have been used safely in the water industry for many years. Dangers can arise when gas escapes occur and when the gas-tight integrity of the system has to be deliberately breached in the course of normal operations. The development and maintenance of proper operating procedures is the key to safety when coupled with properly designed and installed plant and equipment. They should therefore be examined critically before incorporation into working methods and revised as experience dictates and the appropriate information, training/re-training given to NWC Training Division standards.

PB84-168046/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Agricultural and Cooperative Credit System (ACC) in Egypt: An Overview,
F. Shaker. Oct 82, 37p UCD/ADS/EWP-098
Contract AID-263-0041
Prepared in cooperation with Cairo Univ., Giza (Egypt).

Keywords: *Agricultural economics, *Egypt, Legislation, *Project planning, Management, Statistical data, Conflicts, Law enforcement, Developing country application, *Cooperatives.

Agriculture is the most important sector in the Egyptian economy and agricultural cooperatives play an important role in the sector. Among all cooperatives, about 81 percent are in the Agricultural and Credit Cooperative System (ACC). The paper presents in outline form, several important aspects of ACC cooperatives: (1) legislation about and programs for cooperatives, (2) structure of cooperatives, (3) statistics on the ACC system, and (4) problems faced by cooperatives.

PB84-168186/GAA PC **E06**/MF **E06**
National Board for Science and Technology, Dublin (Ireland).
Manual for the Construction and Operation of a Simple Oyster Hatchery.
Aquaculture technical bulletin no. 8,
J. Wilson, J. Simons, and E. Noonan. c1984, 87p

Keywords: *Aquaculture, *Fisheries, Manuals, Construction, Operations, Foundations, Doors, Vents, Maintenance, Floors, Fresh water, Sea water, Design, Larvae, Algae, Reproduction(Biology), Settling, Mortality, Growth, Animal diseases, Aeration, Oyster spat, Gas bubble disease.

This manual is intended to give practical advice on the construction and management of a simple bivalve hatchery. Shellfish hatcheries run on principles that any practical person can learn in a week. This manual has been restricted to the production of spat of the European oyster. The same hatchery system can also produce other bivalve species with little or no modification.

PB84-168442/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Economies of Scale and Family Food Expenditure Patterns in Egypt,
D. Abdou, and R. Green. May 82, 21p UCD/ADS/EWP-074
Contract AID-263-0041
Prepared in cooperation with Zagazig Univ. (Egypt).

Keywords: *Food, *Economic analysis, *Egypt, Urban areas, Rural areas, Policies, Decision making, Commodities, Grants, Developing country application, Economies of scale, Families.

The study investigated the existence and effects of economies of scale in family size in food consumption expenditures among family size groups and between urban and rural areas. Understanding these consumption patterns is important to policy makers as they plan various food subsidy and distribution programs. Using 1974-75 Family Budget Survey data, Engle curves were estimated with expenditure on the food of interest as the dependent variable and total expenditures as the independent variable for various family sizes and urban/rural locations.

PB84-168467/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Promotion of Egyptian Exports of Horticultural Crops: Summary and Proceedings of Economics Policy Workshop (4th).
Mar 82, 39p UCD/ADS/EWP-063
Contract AID-263-0041

Keywords: *Plants(Botany), *Egypt, *International trade, Vegetables, Marketing, Developing country application.

The Fourth Economics Policy Workshop was organized to explore both the role of exports in the development of Egyptian agriculture and the potential for developing Egyptian horticulture crops for export. Production and marketing issues and domestic and international trade problems were discussed to identify policy alternatives for decision makers. The two-day workshop was attended by more than 100 participants who heard 18 presentations by Egyptian and international economists and horticulturalists. The paper presents an overview of the workshop, a brief summary of each presentation, and policy recommendations growing out of the experience.

PB84-168475/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Feasibility of Cut Flower Exports,
H. El-Saadany, N. Waly, and R. L. Simmons. May 83, 25p UCD/ADS/EWP-161
Contract AID-263-0041
Prepared in cooperation with Ain Shams Univ., Cairo (Egypt), Moshtohor Univ. (Egypt) and North Carolina State Univ. at Raleigh.

Keywords: *Plants(Botany), *International trade, *Egypt, Feasibility, Marketing, Demand(Economics), Supply(Economics), Ornamental plants, Imports, Developing country application.

The evaluation of Egypt's entry into the EEC cut flower market would involve the simultaneous consideration of supply and demand for each exporting and importing country. Such an analysis was beyond the available resources for this study, but much relevant information was presented. Data on imports of cut flowers by major Western European countries were given. Production conditions in two of the major supplying countries--Colombia and Kenya--were described. Price response equations to changes in supply were estimated for carnations, roses, and chrysanthemums in West Germany. Apparently elasticities are high enough to allow Egypt to export sufficient quantities without adversely affecting price. Finally, the production and exporting sectors in Egypt were described.

PB84-168483/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Potentials for Exporting Cut Flowers from Egypt,
L. Garoyan, J. Foytik, and S. C. Palmer. May 82, 44p UCD/ADS/EWP-069
Contract AID-263-0041

Keywords: *International trade, *Plants(Botany), *Egypt, Demand(Economics), Cargo transportation, Requirements, Marketing, USSR, Europe, Improvement, Air transportation, Harvesting, Maintenance, Holland, West Germany, France, Developing country application, Wholesale trade, Cooperatives.

The European cut flower market is a large and increasing one, but European growers do not produce enough to meet demand, so substantial quantities are imported from areas with warmer climates. Israel, in particular, has expanded exports to Europe, so much so that the EEC has proposed voluntary cutbacks in their shipments. In weighing the possibilities for Egypt's entering this competitive industry, wholesale markets in Holland, Germany, and France were described, export-import data were provided, and seasonal variation in rose prices in the Dutch auction market was estimated by regression analysis.

PB84-168491/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Choice of Technique under Price Distortion: Case Example of Jeopardized Agricultural Sector,
H. A. Khedr. Apr 82, 35p UCD/ADS/EWP-073
Contract AID-263-0041
Prepared in cooperation with Ministry of Agriculture, Cairo (Egypt).

Keywords: *Agricultural economics, *Egypt, Population growth, Marketing, Market research, Government policies, Prices, Grants, Developing country application, Subsidies.

The paper gives an overview of the incentive structure within Egyptian agriculture and examines its linkages with nonagricultural sectors. Based on the substantially higher growth rates in nonagricultural sectors is the belief that these sectors have more potential for continued development--which may have led to the seemingly continual application of measures biased against agriculture. It is these measures which may have retarded the growth of the agricultural sector by reducing incentives. The paper describes the distorted market structure in Egyptian agriculture resulting from various government pricing and subsidy policies.

PB84-168509/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Mechanical Technology in Egyptian, Indian and Pakistani Agriculture: Observations from an 'Induced Innovation' Perspective,
C. H. Gotsch. Jan 83, 28p UCD/ADS/EWP-132

Contract AID-263-0041
Prepared in cooperation with Stanford Univ., CA. Food Research Inst.

Keywords: *Pakistan, *India, *Egypt, *Agricultural economics, Rural areas, Marketing, Government policies, Supply(Economics), Grants, *Agricultural machinery, Technology transfer, Socioeconomic status, Theorems, History, Developing country application, Institutional framework, Public sector.

Cross-country comparisons run the risk of spurious conclusions because of confounding factors. Still, much can be learned by contrasting agricultural development in three very similar agro-climatic areas which are strikingly different in the degree of governmental intervention: Northwest India, Northeast Pakistan, and Egypt. In Egypt, the government is involved in virtually every facet of agricultural activity. The theory of induced innovation--that technical change occurs so as to augment scarce resources--was used to analyze the historic situation in the three places. It is possible that a public sector, truly interested in the welfare of the rural sector, can read the 'latent' signals given by resource scarcity and play an effective role in inducing the supply of improved technology.

PB84-168517/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Structure of Rice Technology, Farmer Rationality, and Agricultural Policy in Egypt,
J. M. Antle, and A. S. Aitah. May 82, 29p UCD/ADS/EWP-075
Contract AID-263-0041
Prepared in cooperation with Zagazig Univ. (Egypt).

Keywords: *Rice, *Agricultural economics, *Egypt, Government policies, Cost analysis, Prices, Demand(Economics), Manpower, Agricultural machinery, Fertilizers, Black markets, Economic elasticity, Developing country application.

The paper investigates the structure of Egyptian rice technology in the East Delta region of Egypt and uses findings from the empirical analysis to make preliminary policy inferences. A homothetic translog cost function was econometrically estimated, using free (i.e., black) market rather than government-administered prices, to perform tests on the structure of the technology and on hypotheses about input demand elasticities. Results indicated that Egyptian rice farmers exhibit considerable responsiveness to changes in input prices.

PB84-168525/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Fresh Vegetable Exporting Channels: An Example of Tomatoes,
W. Megahid. Oct 81, 15p UCD/ADS/EWP-070
Contract AID-263-0041
Prepared in cooperation with Ain Shams Univ., Cairo (Egypt).

Keywords: *Tomatoes, *Egypt, Production, Efficiency, Marketing, Constraints, Improvement, Consolidation, Corporations, Fresh foods.

Although Egypt produces on average almost 2 million tons of tomatoes annually (over 4 percent of the world's tomato crop), exports of fresh tomatoes were only about 4,000 tons in 1979-80. While most attribute the lack of success in exporting to inefficient production, this report focuses on constraints within the marketing system. Through a case study of a tomato exporting company, some general conclusions are drawn that may be applicable to other commodities. The key to improvement in vegetable exporting lies in consolidation of marketing firms.

PB84-168533/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Pattern of Food Expenditure in Rural Egypt,
M. A. El-Shennawy, and A. I. Abdou. May 83, 25p UCD/ADS/EWP-160
Contract AID-263-0041
Prepared in cooperation with Ministry of Agriculture, Cairo (Egypt) and National Research Center, Cairo (Egypt).

Keywords: *Demography, *Food supply, *Egypt, Population growth, Income, Grants, Imports, Rural areas, Surveys, Budgeting, Residential buildings, Families, Developing country application.

Population growth and rising incomes have combined to increase the demand for food during the last 15 years. But as domestic agricultural production has been almost stagnant, there has been a rapid expansion of food imports. Food subsidies have served to relieve the poor of some of the cost entailed by this ever-increasing food gap. The paper compares the results of the rural family budget surveys of 1958-59, 1964-65, and 1974-75 with the food consumption, family budget study done in 1980-81. This study surveyed 249 households randomly selected from ten Egyptian villages in five regions.

PB84-168541/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Role of Specialized Cooperatives and the Marketing of Potatoes in Egypt,
F. El Shazly, and R. I. Rochin. Mar 82, 13p UCD/ADS/EWP-068
Contract AID-263-0041
Prepared in cooperation with Ministry of Agriculture, Cairo (Egypt).

Keywords: *Potatoes, *Marketing, *Egypt, History, Efficiency, Cost analysis, Prices, Stabilization, Farms, Developing country application, *Cooperatives.

The report presents an overview of the role of agricultural cooperatives in Egypt and discusses the marketing of potatoes by specialized cooperative groups. First, the historical background of agricultural cooperatives in Egypt is given; then, the voluntary nature of the nine specialized cooperatives is contrasted with other types. The report focuses on the potato specialized cooperative and concludes that it has not yet achieved its efficiency potential due to high administrative costs but that it is playing an important role in stabilizing potato-prices and it provides equal opportunities to market, irrespective of farm size.

PB84-168566/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Proceedings of the Economic Policy Workshop on Migration and Mechanization in Egyptian Agriculture (3rd),
A. Richards, P. L. Martin, H. Khedr, H. Kheir El-Din, and S. Nassar. Dec 81, 25p UCD/ADS/EWP-057
Contract AID-263-0041
Prepared in cooperation with California Univ., Santa Cruz, Cairo Univ., Giza (Egypt) and Ministry of Agriculture, Cairo (Egypt).

Keywords: *Agricultural machinery, *Agricultural economics, *Egypt, Manpower, Shortages, Agricultural machinery, Demand(Economics), Conflicts, Developing country application.

In light of three important labor-related phenomena in Egypt--(1) perceptions of agricultural labor shortages, (2) large-scale emigration from agriculture and from Egypt itself, and (3) rapidly increasing demand for, and supply of agricultural mechanization--a two-day workshop was held on the subject 'Migration and Mechanization.' The paper is the report of the proceedings committee for the workshop and gives areas of consensus and disagreement on the principal issues.

PB84-168574/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Distribution of Food Consumption in Relation to Price and Distribution Policies in the Urban and Rural Areas of Egypt,
S. Ismail, D. Abdou, and B. D. Gardner. Mar 82, 25p UCD/ADS/EWP-059
Contract AID-263-0041
Prepared in cooperation with Cairo Univ., Giza (Egypt) and Zagazig Univ. (Egypt).

Keywords: *Agricultural economics, *Food supply, *Egypt, Commodities, *Rural areas, Urban areas, Income, Grants, Government policies, Expenses, Distribution(Property), Equalizing, Rationing.

The paper discusses the distribution of consumption of important agricultural commodities in rural and urban areas of Egypt. Of particular interest, is whether the per capita consumption of certain commodities varies significantly among income classes and between urban and rural areas and how these consumption patterns are related to the government's subsidy and rationing policies. The data base was two family budget surveys conducted in Egypt in 1964-65 and 1974-75.

PB84-168814/GAA PC **A05**/MF **A01**
Food and Drug Administration, Rockville, MD. Bureau of Veterinary Medicine.
FDA Veterinarian: 1983 Compilation and Index,
L. Isner. 1983, 84p* FDA/BVM-84/33
See also PB82-164435 and PB81-163628.

Keywords: *Veterinary medicine, *Drugs, National government, Legislation, Policies, Regulations, Medical equipment, Animals, Law(Jurisprudence).

The FDA Veterinarian is a publication of the Bureau of Veterinary Medicine's (BVM) Information and Education Staff concerning the Bureau's activities in the regulation of animal drugs, devices, feeds, and related topics. FEDERAL REGISTER announcements pertaining to BVM are routinely covered in the publication, along with other items the Bureau feels are of interest to veterinarians, producers, the drug and feed industry, industry news media, and educational institutions.

PB84-168905/GAA PC **A05**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Selected Papers Presented to the ADS (Agricultural Development Systems) Economics Policy Workshop on 'Food Price Policy and Subsidies' (9th).
Jun 83, 79p UCD/ADS/EWP-159
Contract AID-263-0041

Keywords: *Economic analysis, *Food, *Egypt, Grants, Recommendations, Social effect, Political objectives, Distribution(Property), Government policies, Developing country application.

As an introduction to the ADS workshop on food price policy and subsidies, Dr. Dyaa Abdou laid out the issues for discussion. The workshop's aim was not only to present research findings and recommendations, but also to educate all persons involved toward a better understanding of the social, economic, and political impacts of changing (or not changing), any of these policies.

PB84-168970/GAA PC **A07**/MF **A01**
Pennsylvania State Univ., University Park.
Restoration of Failing On-Lot Sewage Disposal Areas.
Final rept. Aug 79-Jul 83,
D. D. Fritton, W. E. Sharpe, A. R. Jarrett, C. A. Cole, and G. W. Peterson. Mar 84, 139p EPA-600/2-84-062
Grant EPA-R-807115

Keywords: *Sewage disposal, Renovating, Residential buildings, Water flow, Adsorption, Water conservation, Ditches, Failure.

The objective of this project was to evaluate two rehabilitative techniques-water conservation and absorption bed resting--for restoration of failing on-site sewage disposal areas. Eleven homes with failing absorption areas were characterized and baseline water flow and septic tank effluent quality data were collected. Water conservation devices were then installed at maximum, moderate or minimum levels of predicted water reduction capability. At three sites effluent was also diverted to a specially designed alternate trench for 10 months which permitted the main absorption area to rest. Median in-house water reductions were statistically significant and ranged from 9.8 to 42.5%. Maximum levels of water conservation were generally successful in restoring failing systems while lesser levels of conservation were not successful.

PB84-169028/GAA PC **A03**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.
Macrosismo de Oaxaca 29 de Noviembre de 1978 (Earthquake of November 29, 1978),
J. Figueroa. Nov 81, 32p SER-445

Keywords: *Earthquakes, *Disasters, Seismic epicenters, Seismology, *Mexico, Oaxaca(Mexico), Ground motion, Developing country application.

The effects of the earthquake of November 29, 1978, at 19 h 52 m 49s with magnitude Mb 6.5-7 (Richter) and epicenter in the State of Oaxaca are described. A list of motions in the same epicentral regions before and after the date mentioned above is included. According to information received from different sites, a map of isoseismals is presented in order to show the intensities (in Modified Mercalli Scale 1931) of earthquake in an area of about 420,000 sq km of Mexican Territory.

PB84-169044/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Wooden Bridges: UNIDO'S (United Nations Industrial Development Organization's) Prefabricated Modular System.
1983, 21p UNIDO/PI/88
Color illustrations reproduced in black and white.

Keywords: *Construction, *Bridges, *Wooden structures, *Kenya, Access roads, Forest trees, Shortages, Abundance, Cost estimates, Weight(Mass), Steel construction, Metal plates, Acceptability, Photographs, Subsaharan Africa, Developing country application.

The United Nations Industrial Development Organization (UNIDO) has developed, through a project in Kenya financed by the United Nations Development Programme (UNDP), a unique bridge system suitable for developing countries with or without forest resources. The bridges can span up to 30 meters (longer bridges with multiple spans are possible) and carry up to 40 tons live load and are therefore most suitable for secondary and access roads. The bridges are fully engineered; the cost is estimated to be less than one-half that of reinforced-concrete bridges.

PB84-169051/GAA PC **E05**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Technical Profiles for Production of Pharmaceutical Dosage Forms.
27 Sep 83, 91p UNIDO-ID/WG.393/14, V-83-62182

Keywords: *Drugs, *Technology transfer, Dosage, Manufacturing, Safety, Developing country application.

To improve the availability of most essential drugs for the health requirements of developing countries and to promote industrialization in the Pharmaceutical Sector, UNIDO has prepared a series of technical profiles offering guidance to developing countries in establishment of units for production of pharmaceutical dosage forms. This document covering design, layout, process flow, equipment and other technical inputs, is expected to serve as a reference paper for phased setting up of industrial units initially commencing with pharmaceutical preparation for oral use and progressively incorporating production of parenteral dosage forms.

PB84-169069/GAA PC **E08**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Review of Technology and Technological Development in the Wood and Wood Processing Industry and Its Implications for Developing Countries.
Sectoral working paper series no. 8,
J. F. Brotchie. 1983, 151p* UNIDO/IS.413, V-83-64067

Keywords: *Wood, Processing, *Wood products, Wood wastes, Public health, Safety, Forestry, USSR, International trade, Taxes, Woodworking, Energy, Supply(Economics), Demand(Economics), Panels(Structural), Wood particle boards, Lumber, Fiberboards, Trends, Global, Developing country application, Wood industry, Energy demand.

This paper has been prepared in connection with the First World-Wide Study of the Wood and Wood Processing Industries. It contains a detailed description of the technical aspects of various production processes and products in the wood and wood processing industries. Particular emphasis is placed on showing how these various technologies relate to conditions in the developing countries. The information in this report is used extensively in the World-Wide Study.

PB84-169077/GAA PC **A13**/MF **A01**
Fondo Colombiano de Investigaciones Cientificas y Proyectos Especiales, Bogota.
La Fundicion en Colombia (Foundries in Colombia),
M. Infante, G. Poveda, J. Laverde, J. A. Jaimes, and A. Borrero. c1979, 298p
Text in Spanish.

Keywords: *Foundries, *Socioeconomic status, *Technology assessment, Capital, Professional personnel, Industrial training, Metallurgy, Raw materials, *Colombia, Developing country application, Social factors, Technology assessment.

This study establishes a base for the sectoral development of foundries in Colombia. It provides a historical analysis of foundry activities, its economic, social, and technical structure, and derives broad lines for a program for technological development. It covers geographical distribution, employment, production, productivity, market structure, metal mechanics, the automotive industry, the Andean market, raw materials, investment and capital under the economic structure. Under the technological profile it covers metalurgical aspects, raw materials, technological characteristics of the processes, and scientific-technological resources. Under the Sociological profile it covers industrial security, salary levels and syndicalism, human resources, training, national production of engineers, and professional training of operators and mid-level technicians. (Copyright (c) Colciencias 1979.)

PB84-169085/GAA PC **A14**/MF **A01**
Universidad de los Andes, Bogota (Colombia). Centro de Estudios e Investigacion.
Technologia Apropiada: Resumenes de Investigaciones Realizadas en el Departamento de Ingenieria Mecanica de la Universidad de los Andes (Appropriate Technology: Results of Studies by the Mechanical Engineering Department of the University of the Andes).
1983, 315p D-1
Text in Spanish.

Keywords: *Research and development, *Wind energy, *Biomass, Wind power generation, Hydraulics, Refrigeration, Water treatment, Agricultural wastes, Developing country application.

This report presents 89 summaries of appropriate technology projects in the fields of agroindustry, central heating, biomass, wind energy, hydraulics, civic works, refrigeration, water treatment, and agricultural waste. Each summary gives sufficient information to decide whether one should initiate such a project, the results obtained, and the people and organizations who obtained these results.

PB84-169416/GAA PC **A09**/MF **A01**
Centec Corp., Reston, VA.
Water Recycle in the Organic Chemical and Plastic Materials Industries.
P. Crampton, A. Procko, D. Sherman, and J. Boutross. Jul 83, 186p* OWRT-90181-R(0473)(1), , OWRT/RU-82/18
Contract DI-14-34-0001-0473

Keywords: *Chemical industry, *Plastics, Technology, Industrial waste treatment, Coagulation, Substitutes, Tables(Data), Design criteria, Performance evaluation, *Waste water reuse.

Findings are presented of a study to assess the potential for fresh water withdrawals in the Organic Chemical and Plastic Materials industry by internal recycle of water or the use of reclaimed municipal effluent. Broadly applicable water recycle options were evaluated in terms of the impact of total water withdrawal for individual facilities, specific products, individual water resource region, and the industry as a whole. The report concludes that currently available technology, if broadly applied, has the potential to significantly reduce water withdrawals by the industry. The recycle options evaluated have proved successful in the limited applications implemented at this time. Recommendations for future activity to foster implementation of water recycle options are also presented.

PB84-169531/GAA PC **A06**/MF **A01**
International Fertility Research Program, Research Triangle Park, NC.
Determinants of Contraceptive Use, Reproductive Goals and Birth Spacing in Relation to Mortality, Breast-Feeding and Previous Contraceptive Behavior,
B. Janowitz, and D. J. Nichols. Nov 80, 119p AID-PN-AAJ-898
Grant AID/DSPE-G-0012

Keywords: *Contraceptives, *Family planning, Humans, Pregnancy Contraception, Egypt, Sudan, Nigeria, Reproduction(Biology), Developing country application, *Birth control.

To determine the extent to which pregnancy intervals, desired fertility levels, and future contraceptive plans are determined by previous pregnancy outcomes, breastfeeding, and previous contraceptive behavior, a study was made of 20,000 women who delivered at selected maternity hospitals in Iran, Egypt, the Sudan, and Nigeria. Results of that study are presented and analyzed in this report. Following the presentation of comparative demographic profiles of each of the four groups and a summary description of the relationship among the variables, the variables are subjected to standard linear regression analysis with pregnancy intervals, fertility intentions, and contraceptive plans as dependent variables.

PB84-169572/GAA PC **A12**/MF **A01**
Agency for International Development, Washington, DC.
Design and Evaluation of Aid-Assisted Projects.
Nov 80, 270p AID-PN-AAK-047

Keywords: *Research and development, *Project planning, Scheduling, Design, Evaluation, Objectives, Developing country application.

A.I.D.'s Project Design and Evauation Workshop presents to Agency personnel A.I.D.'s system of development project formulation and evaluation. This text is designed to serve as a resource both during the workshop and in the field. After outlining the three steps in the A.I.D. project management process--planning (establishing goal and purpose), implementation (including interim evaluations), and final evaluation--the context of project design, including foreign assistance objectives and sample criteria for selecting from among alternative projects, is set forth. Against this background, the purposes of all A.I.D. project documents are explained and exemplified.

PB84-169580/GAA PC **A04**/MF **A01**
Agency for International Development, Washington, DC.
Women's Organizations: Resources for Development,
K. B. Piepmeir. Oct 80, 56p AID-PN-AAJ-772

Keywords: *Women, *Community development, Organizations, *Employment, Development, Children, Education, Specialized training, Developing country application.

Women's groups are a uniquely effective means for promoting women in development (WID) activities. Against a background discussion of these groups' general development potential and needs and of institutional resources capable of assisting women's groups, this report develops strategies and makes recommendations for donor assistance. Factors as diverse as stereotyping men as breadwinners, excluding women's economic contributions from official statistics, and assuming that women will benefit from the trickle-down effect of a modernized society keep women's real and potential contribution to development largely invisible. Reversing this situation will require meeting women's key needs--expanding their productive capacity by developing appropriate technologies and childcare facilities and improving women's access to education, vocational training, and health care. A total of 25 specific recommendations are appended.

PB84-169713/GAA PC **A04**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg.
Various Perspectives on Using Women's Organizations in Development Programming,
M. W. Hoskins. Jul 80, 52p AID-PN-AAJ-774
Contract AID/otr-147-80-45

Keywords: *Women, *Community development, Organizations, Specialized training, Development, Objectives, Developing country application.

Indigenous women's organizations can be effective intermediaries between donors and developing country women in implementing women in development (WID) projects. This paper summarizes discussions held at a series of A.I.D. conferences on this potential and discusses ways to make it a reality. The author provides two criteria for WID projects- to integrate women into all aspects of development, especially in the modern sector, and to give them more control over their future by improving their skills-and suggests ways for improving the use of women's organizations in achieving WID objectives. A 53-item bibliography (1974-80) and an appendix on selected non-indigenous intermediaries representing six different organizational frameworks is included.

PB84-169820/GAA PC **A15**/MF **A01**
Centers for Disease Control, Atlanta, GA. Center for Health Promotion and Education.
Family Planning Methods and Practice: Africa.
Sep 83, 338p HHS/CDC/CHPE-84-0220
Sponsored in part by Agency for International Development, Washington, DC.

Keywords: *Africa, *Health, Counseling, Medical services, Medical personnel, Nurses, *Family planning.

The report, the product of collaboration between five African and five American authors, the Centers for Disease Control, Emory University, and the U.S. Agency for International Development, was developed to serve as a practical handbook/reference for African medical, nursing, and midwifery students and their instructors as well as for providers of family health care. The secondary audience includes policymakers and the international development community. The book is of particular importance to providers of service who want to be current in their approach to family planning, sensitive to the cultures of their clients, and yet work within the constraints of their health system.

PB84-169879/GAA PC **A05**/MF **A01**
Agency for International Development, Washington, DC.
Role of Rural Haitian Women in Development,
J. N. Smucker. Feb 81, 78p AID-PN-AAJ-894

Keywords: *Women, *Haiti, Development, Organizations, *Rural areas, *Employment, Education, Children, Developing country application.

To help promote development in Haiti while avoiding the deterioration of women's status that development based on developed country norms often entails, this study profiles Haitian rural women and suggests suitable assistance strategies. A description of the socioeconomic setting of Haitian rural women highlights traditional values--the importance of marriage (legal or customary) and children and the authority of the husband. To show the involvement of Haitian women in commerce, their predominant economic role, sketches are provided of marchandes (market ladies) in different regions. The author recommends assistance strategies for women that focus on: (1) agricultural insurance credit to increase production of internally marketed produce and increase women's involvement in commerce; (2) making seed available for kitchen gardens; (3) French language instruction; (4) home industry expansion; (5) cooperatives based on the extended family; (6) markets for handicrafts; (7) teaching women new trades or skills, which they are enthusiastic to learn; and (8) women's primary needs and traditional values. A 44-item list of references (1940-81) is included.

PB84-169952/GAA PC **A07**/MF **A01**
Michigan State Univ., East Lansing. Dept. of Agricultural Economics.
Farming Systems Research: A Critical Appraisal.
Rural development paper,
E. H. Gilbert, D. W. Norman, and F. E. Winch. 1980, 149p MSU/RURAL DEVELOPMENT PAPER-6, AID-PN-AAK-049
Contract AID/ta-CA-3

Keywords: *Farming, *Cost benefits, *Industrial development, *Management techniques, Research projects, Prototypes, Research projects, Columbia, Guatemala, Senegal, Political objectives, Social effect, Human behavior, Education, Benefit cost analysis, Developing country application, Small farms, Institutional framework.

It is increasingly evident that public investment in farming system research (FSR) over the last 20 years has been focused on the needs of commercial farmers and professional researchers rather than on the needs of developing country small farmers. Defining farming systems as human and environmental totalities, the authors of this state-of-the-art study review the literature on FSR, evaluate current FSR programs, and make recommendations to make FSR more responsive to small farmer needs. The political, social, technological, and human components of a farm system are reviewed, and a framework and general description are provided for 'downstream' FSR.

PB84-169960/GAA PC **A09**/MF **A01**
National Savings and Loan League, Washington, DC.
Technical Manual for Erosion and Sediment Control in Urban Areas of Developing Countries,
J. G. Boyer, J. A. Avalos, and P. R. Gabele. Mar 80, 176p AID-PN-AAK-014
Contract AID/otr-C-1453

Keywords: *Urban planning, *Water management, *Soil erosion, Manuals, Land use, Drainage, Waterways(Watercourses), Streams, Soil stabilization, Tables(Data), Developing country application, Storm water runoff.

Uncontrolled storm runoff in rapidly growing urban areas of the tropics is severely constraining land development, reducing groundwater reserves, and hastening soil erosion. This manual provides practical guidelines and technical materials to assist A.I.D. and host country officials engaged in land development projects to prevent such uncontrolled storm runoff.

PB84-170034/GAA PC **A20**/MF **A01**
iOX Assessment Associates, Culver City, CA.
Evaluation Handbook for Health Education Programs in Nutrition.
Sep 83, 457p HHS/CDC/CHPE-84-0221
Contract PHS-200-81-0622

Keywords: *Education, *Nutrition, Evaluation, Measuring instruments, Handbooks, Project management, Surveys, *Health education.

This Evaluation Handbook for Health Education Programs in Nutrition contains a series of measuring instruments to be used in program evaluation. The measuring instruments are designed to assess program participants' behaviors, skills, affect, and knowledge. The handbook contains measuring instruments developed specifically for the knowledge. The handbook contains measuring instruments developed specifically for the handbook as well as a number of existing measures already being used by health educators. All measures, both newly developed and existing, can be used to assess the attainment of a set of program out comes that had been judged significant by a group of experts in the field. In addition to the measuring devices, the handbook also contains a brief introduction to salient considerations in the conduct of program evaluations in health education. Guidance is also provided in the use of the handbook's measures. Finally, because all the newly developed measuring instruments are criterion-referenced assessment devices, the test specifications for all newly developed measures are included in the handbooks.

PB84-170075/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Agriculture and Food Policy in Egyptian National Planning,
M. H. Fag El Nour. Oct 82, 31p UCD/ADS/EWP-100
Contract AID-263-0041
Prepared in cooperation with Ministry of Planning, Cairo (Eygpt).Portions of this document are not fully legible.

Keywords: *International trade, *Agriculture, *Egypt, Project planning, *Food, Surpluses, Government policies, Exports, Agricultural machinery, Improvement, Population growth, Income, Farm crops, Tables(Data), Employment, Salaries, Developing country application, Priorities.

Although industrialization potentially offers substantial benefits to Egypt's economy, its success depends on a strong agricultural base, particularly on the ability of agriculture to create an agricultural surplus. The picture, however, is discouraging as growth in food imports has far exceeded growth in agricultural exports and the gap is growing. The paper presents an overview of the situation in Egypt's agriculture which apparently has received a rather low policy priority relative to other sectors in the past two or three decades.

PB34-170083/GAA PC **A04**/MF **A01**
Agency for International Development, Washington, DC.
Sociolinguistic Context of Literacy Programs: A Review of Non-Formal Adult Literacy Programs in AID (Agency for International Development),
S. J. Hoben. Jul 80, 72p AID-PN-AAJ-034

Keywords: *Rural areas, Foreign countries, Disadvantaged groups, Project planning, Minority groups, *Education, Developing country application.

While the world's literacy rate increased from 55.7% to 64% from 1950 to 1980, the estimated number of illiterate people rose during the same period from 700 million to 814 million. Despite A.I.D.'s mandate to promote literacy among the rural poor and disadvantaged minorities within developing countries, A.I.D. has done relatively little in this field. The study recommends that A.I.D. broaden its literacy programs to include elementary education projects and support for language planning and for publishing in previously unwritten languages. A.I.D.'s country planning should incorporate sociolinguistic information about language distribution, communicative functions of languages, and social patterns of language use. As part of project identification, A.I.D. should assess the need for literacy in the target area's economic development, the language use of various social groups in the target area, and the appropriateness of the project given the area's literacy climate. Finally, in project design, A.I.D. should carefully consider which language to use when teaching literacy, the developmental stage of a nation's writing system, and the match between teaching methods and the type of writing system.

PB84-170091/GAA PC **A07**/MF **A01**
International Center for Research on Women, Washington, DC.
Keeping Women Out: A Structural Analysis of Women's Employment in Developing Countries.
Apr 80, 127p AID-PN-AAJ-228
Contract AID/otr-C-1801

Keywords: *Employment, *Women, *Socioeconomic status, Unemployment, Policies, Attitudes, Salaries, Mobility, Health, Legislation, Developing country application, Labor force.

Despite the undeniable need for women in developing countries to obtain gainful employment, the many restrictions imposed on female work result in unemployment, underemployment, and marginality of the women's labor force. This study analyzes the changing economic roles and responsibilities of women, women's contribution to national development, demand and supply constraints on the female work force, and the critical issues related to female employment and provides policy recommendations to enhance women's employment. Recommendations for minimizing the constraints on women's employment, marginality, protective legislation, and 'double burden' are offered, along with suggestions for promoting off-farm employment and more equitable TNC employment conditions. A 116-item bibliography (1969-80) in English, Spanish, and Portuguese is included.

PB84-170109/GAA PC **A03**/MF **A01**
International Crops Research Inst. for the Semi-Arid Tropics, Patancheru (India).
Farming Systems Components for Selected Areas in India: Evidence from ICRISAT (International Crops Research Institute for the Semi-Arid Tropics),
H. P. Binswanger, S. M. Virmani, and J. Kampen. Jul 80, 46p RR-2, AID-PN-AAJ-402
Grant AID/ta-G-1421

Keywords: *Farming, *Water management, *India, Watersheds, Semiarid land, Profits, *Water supply, Runoff, Soils, *Irrigation, Peas, Leguminous plants, Developing country application, Maize, *Water management(Applied).

Research on natural watersheds in India has shown that using more input-intensive farming systems than those presently used in the semiarid tropics can substantially raise farm profits. This report outlines successful soil and water management, cropping, runoff collection, and supplementary irrigation systems for use in the semiarid tropics.

PB84-170117/GAA PC **A04**/MF **A01**
Michigan State Univ., East Lansing. Non-Formal Education Information Center.
Women in Development: A Selected Annotated Bibliography and Resource Guide.
L. G. Vavrus, and R. Cadieux. 1980, 70p
ANNOTATED BIB-1, AID-PN-AAJ-556
Contract AID-DSPE-C-0067

Keywords: *Women, *Economic development, *Socioeconomic status, Regional planning, *Employment, Family relations, Nutrition, Health, Organizations, Books, Periodicals, Developing country application.

It is becoming increasingly clear that the costly efforts to integrate women more fully into the development process, e.g., by including nontraditional roles within the scope of women's activities, are often thwarted by long-standing cultural, political, social, and economic traditions. In response to the expanding literature on these issues and increased reader interest, Michigan State University's Non-Formal Education (NFE) Center has prepared this annotated bibliography to update a 1978 bibliography on women in development published in The NFE Exchange.

PB84-170190/GAA PC **A10**/MF **A01**
Agency for International Development, Washington, DC.
Characteristics and Needs of Out-of-School Youth,
D. W. Kahler, and J. M. Droegkamp. Apr 80, 215p
AID-PN-AAJ-119

Keywords: *Vocational guidance, *Education, *Employment, Rural areas, Urban areas, Specialized training, Females, Developing country application.

The inability of the formal school system in developing countries to keep pace with rising population growth has led to increasing numbers of out-of-school youth unprepared to participate in the development process, thereby retarding the process itself. This paper analyzes the characteristics and needs of out-of-school youth in developing countries and proposes priority recommendations for A.I.D. assistance. The needs of this youth population for employment, training and educational opportunities and for sociopolitical participation are analyzed, along with traditional project responses to these needs. Nonformal education (NFE) programs have often been the most appropriate response because of their ability to link skills development with youth's realistic needs while being the most adaptable to local needs, trainee schedules, and changing conditions. Appended are country-specific illiteracy rates for the 15-19 age group in 20 developing countries, a review of various rural NFE programs, a review of two entrepreneurial and management skills training programs, and a 155-item bibliography (1969-80) in English and French.

PB84-170356/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Factors Affecting Animal Protein Adequacy among the Rural Egypt Population,
S. Lane. Oct 82, 10p UCD/ADS/EWP-099
Contract AID-263-0041

Keywords: *Nutrition, *Proteins, *Egypt, Rural areas, Animals, Developing Country Application.

Soliman's study documented the extent of the protein gap among Egypt's rural poor and found the inadequacy particularly pronounced in animal protein. To learn more about the relationship between animal protein deficiency and other factors, a multiple regression was fitted by ordinary least squares using data from a 1981-82 survey of 249 rural households. Animal protein as a proportion of total protein was seen as a linear function of family size, age of household head, number of feddans managed, number of cows or buffalos in the village, and four shift variables for five regions (North Delta, Middle Delta, Southern Delta and Northern Middle Egypt, Middle Egypt, and Upper Egypt).

PB84-170489/GAA PC **A08**/MF **A01**
Universidad Nacional Autonoma de Mexico, Mexico City. Inst. de Ingenieria.
Behavior of Spillways in Mexican Dams,
J. L. Sanchez Bribiesca. Oct 79, 158p* E-40
Sponsored in part by Secretaria de Agricultura y Recursos Hidraulicos, Mexico City.

Keywords: *Construction, *Dams, Design criteria, Construction, Operations, Mathematical models, Safety, Capacity, Mexico, Developing country application.

Spillway works in large dams have experimented a great evolution in their three distinctive phases; design, construction and operation. As long as accumulated experience and technological advance have been increased, design criteria have been improved in such a way that, besides an adequate selection of floods that guarantee the dam safety in the first place, attention has also been paid on the prevention of damages, which could be so undesirable as a probable over spilling caused by an insufficient capacity of the spillway. The diagnosis of the state of art has been configured through a careful observation of functioning spillways and a verification of their real operation with that of the hydraulic models.

PB84-170745/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Productive Efficiency of the Broiler Industry in Egypt.
Economics working paper series,
I. Soliman, and A. Ibrahim. Mar 83, 19p UCD/ADS/EWP-122
Contract AID-263-0041
Prepared in cooperation with Zagazig Univ. (Egypt).

Keywords: *Poultry, *Egypt, *Productivity, *Agricultural economics, Food, Production, Farms, Budgeting, Output, Market value, Prices, Grants, Investments, Efficiency, Comparison, Imports, Mortality, Cost analysis, Developing country application, Broilers.

Under the recent government food security strategy of subsidizing broiler production, the number of units increased from 2,338 in 1975 to 3,035 in 1980 with another 1,000 added in 1981. The paper addresses the tradeoff between producing broilers domestically vs. importing frozen broilers. The objective was to analyze production efficiency, returns to investment, and Egypt's comparative advantage in producing broilers. A sample of 32 farms was size-stratified into four classes and budget analysis was used to examine their productive efficiency.

PB84-170794/GAA PC **A08**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Annual Report: Phase One of the Farm Efficiency Activity.
Economics working paper series,
J. M. Antle, and A. S. Aitah. Feb 82, 160p UCD/ADS/EWP-076
Contract AID-263-0041
Prepared in cooperation with Zagazig Univ. (Egypt).

Keywords: *Farming, *Crops, *Agricultural economics, *Egypt, Farm crops, Agronomy, Production, Decision making, Prices, Fertilizers, Cotton, Rice, Wheat, Government policies, Corn, Efficiency, Developing country application, Maize.

The report summarizes the research of the ADS Farm Efficiency Activity from February 1981 to January 1982. Data were assembled, agricultural policies regarding input use and production of major field crops were surveyed, and preliminary empirical analysis of the effects of these policies on farmers' production decisions and on agricultural productivity was provided. Findings indicate that Egyptian farmers are very price responsive in making decisions about input use. Their rationality in this regard suggests that a major effect of Egyptian agricultural policies has been to discourage productivity growth in major crops, leaving agriculture to stagnate, while demand for its products is increasing rapidly.

PB84-171040/GAA PC **A07**/MF **A01**
Johnson (Jeffalyn) and Associates, Inc., Falls Church, VA.
African Women in Development.
Apr 80, 141p AID-PN-AAK-439
Grant AID/afr-C-1629

Keywords: *Women, *Employment, *Project planning, Regional planning, Design, Evaluation, Developing country application.

While the design and implementation of women in development (WID) projects are flawed, these innovative projects do conform to A.I.D. mandates and with modifications are replicable. So concludes this study of seven small-scale WID projects involving vegetable production and women's workload in Senegal, day care in Ghana, the cloth industry in Sierra Leone, and studies of the vegetable tannin and silkworm industries and of the role of women in Upper Volta. Regarding the projects' designs, in many cases outputs were not quantified, goals and purposes were unrealistic, feasibility studies (when conducted) were ignored, baseline data were inadequate, and input from the target population was insufficient. The author recommends that WID projects requested by potential beneficiaries to meet a specific need be adequately developed and funded, but that multi-sector WID projects be integrated into larger rural development programs. Further, WID project designs should: include feasibility studies of the project's impact and realistic outputs, purposes, and goals; be allotted adequate time and money; and contain plans for interim and final evaluations.

PB84-171099/GAA PC **A09**/MF **A01**
California Univ., Riverside. Dept. of Soil and Environmental Sciences.
Methodologies to Predict the Mobility and Availability of Hazardous Metals in Sludge-Amended Soils,
G. Sposito, J. P. LeClair, C. S. LeVesque, and N. Senesi. Jan 84, 192p OWRT-B-212-CAL(1)

Keywords: *Soils, *Metals, *Sewage disposal, Trace elements, Transport properties, Metal containing organic compounds, Solubility, Farm crops, Assessments, Sorption, Electron paramagnetic resonance, Agricultural products, Plants(Botany), Land disposal.

Research was undertaken to develop practicable laboratory methods for assessing the solubility and plant-availability of potentially hazardous trace metals accumulating in arid-zone soils receiving sewage effluents or sludges. Sequential extraction of field soil samples with potassium nitrate, water, sodium hydroxide, sodium EDTA, and nitric acid was shown to provide reliable estimates of trace metal solubility and uptake (leaf concentration) by barley, irrespective of soil texture, rate of sludge application, or time during a three-year study period. The total concentrations of the trace metals Ni, Cu, Zn, Cd, and Pb accumulated in two sludge-amended field soils during the project period were comparable with the amounts of these metals sorbed by untreated soils at soil solution concentrations below 100 parts per billion. At these low metal concentrations, the sorption isotherms often exhibited a sigmoid shape that precludes intrepretation of terms of conventional distribution function techniques. Organic forms of the trace metals, particularly copper, were found to increase in importance with the sludge application rate. These organic-metal compounds could be characterized conveniently by electron spin resonance spectrometry.

PB84-171255/GAA PC **A07**/MF **A01**
Illinois Univ. at Urbana-Champaign. Coll. of Agriculture.
Sources of Resistance to Selected Fungal, Bacterial, Viral and Nematode Diseases of Soybeans,
O. Tisselli, J. B. Sinclair, and T. Hymowitz. Dec 80, 128p AID-PN-AAJ-876
Contract AID/ta-C-1294

Keywords: *Soybeans, *Plant diseases, Fungus diseases, Bacteria, Viruses, Nematoda, Photographs, Defoliants, Developing country application.

Soybean breeders and plant pathologists often have difficulty finding sources of resistance to soybean pathogens because the relevant information is scattered in many publications with a limited circulation. This publication provides an organized reference of soybean diseases for professionals concerned with this problem. Of over 100 soybean pathogens known to exist, only 35 are of economic importance. This report considers 19 diseases, of which 11 are caused by fungi, 4 by viruses, and 2 each by nematodes and bacteria. A description of the pathogens, their symptoms, and photographs of infected plants are provided.

PB84-171313/GAA PC **A14**/MF **A01**
Georgia Inst. of Tech., Atlanta.
Role of State and Local Industrial Finance Programs in Small Business Financing.
Final rept.,
D. E. Fyffe. Dec 82, 314p*
Contract SBA-2657-OA-79

Keywords: *Financial management, Legislation, Federal assistance programs, Project management, *Small businesses, Industrial financing programs.

This report presents the results of an extensive study of state and local industrial financing programs. The purposes of the report are to provide (1) a comprehensive survey and analysis of state and local industrial financing programs, (2) a comparative evaluation of program effectiveness, and (3) recommendations related to public intervention in industrial financing. The report should be useful to industrial developers, public policy makers, and others interested in industrial financing incentives.

PB84-171727/GAA PC **A22**/MF **A01**
IOX Assessment Associates, Culver City, CA.
Evaluation Handbook for Health Education Programs in Diabetes.
Sep 83, 523p* HHS/CDC/CHPE-84-0222
Contract PHS-200-81-0622

Keywords: *Education, *Health, Diabetes mellitus, Project management, Evaluation, Measuring instruments, *Health education.

This Evaluation Handbook for Health Education Programs in Diabetes contains a series of measuring instruments to be used in program evaluation. The measuring instruments are designed to assess program participants' behaviors, skills, affect, and knowledge. The handbook contains measuring instruments developed specifically for the handbook as well as a number of existing measures already being used by health educators. All measures, both newly developed and existing, can be used to assess the attainment of a set of program outcomes that had been judged significant by a group of experts in the field. In addition to the measuring devices, the handbook also contains a brief introduction to salient considerations in the conduct of program evaluations in health education. Guidance is also provided in the use of the handbook's measures. Finally, because all the newly developed measuring instruments are criterion-referenced assessment devices, the test specifications for all newly developed measures are included in the handbooks.

PB84-172667/GAA PC **A18**/MF **A01**
Office of Technology Assessment, Washington, DC.
Water-Related Technologies for Sustainable Agriculture in U.S. Arid/Semiarid Lands.
Oct 83, 415p* OTA-F-212
See also PB84-102912. Library of Congress catalog card no. 83-600595.

Keywords: *Irrigation, *Water supply, *Water management, *Arid land, Agriculture, Water distribution, Efficiency, Water storage, Ground water, Land use, Rangeland, Water supply.

This report assesses existing and emerging water-related technologies for their ability to support long-term productivity of arid/semiarid agricultural plants and animals in the context of institutional factors, water supply/use relationships, and the characteristics of the renewable natural resource base on which agriculture depends. The technologies examined by the study are generally directed toward: (1) improving efficiency of water use, whether for rain-fed (dryland and rangeland) systems or irrigation; (2) improving water management, storage, and distribution for agriculture; and (3) augmenting existing supplies with additional water not previously available.

PB84-173921/GAA PC **A08**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
Selected Socioeconomic Development Indicators: Africa, Asia, Europe, Latin America, the Middle East, and North America/Oceania,
T. Vollrath, D. Timms, and E. Reynolds. Mar 84, 161p* SB-705

Keywords: *Economic analysis, *Agricultural economics, *International trade, Statistical analysis, Supply(Economics), Demand(Economics), Policies.

Data on 29 development indicators for 79 countries in six different geographical regions are in 162 tables that carry various indicators of agricultural demand, supply, policy, and trade. These variables help to explain the agricultural development process, with special emphasis on international agricultural trade. This data base is useful in quantitative analyses and evaluations of the relationships between economic development and agricultural trade. Most tables report annual data from 1953 through 1977 as well as 5-year averages from 1955 to 1975.

PB84-174150/GAA PC **A10**/MF **A01**
Sverdrup and Parcel and Associates, Inc., St. Louis, MO.
Wastewater Recycle and Reuse Potential for Indirect Discharge Textile Finishing Mills. Volume 1. Technical Report.
Final rept. Apr 81-Jun 83,
J. F. Bergenthal. Mar 84, 212p EPA-600/2-84-070A
Contract EPA-68-02-3678
See also PB84-174168.

Keywords: *Textile industry, Circulation, Design criteria, Performance evaluation, Feasibility, Technology, Capitalized costs, Economic analysis, Industrial waste treatment, *Waste water reuse.

The report gives detailed information on a variety of wastewater recycle/reuse technologies that allow textile finishing mills to reduce the volume of waste-water and the amount of pollutants discharged to publicly owned treatment works. (NOTE: Dyebath reconstitution is described separately.) Many of these technologies have been demonstrated full-scale, but only a few have become widely applied in the textile industry. Technical and economic factors affect the application of most of these technologies at a given mill; thus, each must be considered under its own mill-specific conditions. Included for each described technology are a description, its environmental benefits, recycle and treatment system schematics, design criteria, technical factors that limit or enhance its application, capital and yearly costs, factors that affect its economic feasibility, its current applications, and references for further information. The information in this report is based on a survey of the literature, discussions with equipment/process vendors and researchers, and engineering studies at six textile finishing mills. The six mills provide a good cross-section of the variety of products, fibers, manufacturing processes, and potential recycle/reuse technologies encountered in textile finishing. Volume 2 of the report consists of the six mill engineering reports.

PB84-174168/GAA PC **A17**/MF **A01**
Sverdrup and Parcel and Associates, Inc., St. Louis, MO.
Wastewater Recycle and Reuse Potential for Indirect Discharge Textile Finishing Mills. Volume 2. Six Mill Engineering Reports.
Final rept. Apr 81-Jun 83,
J. F. Bergenthal. Mar 84, 386p EPA-600/2-84-070B
Contract EPA-68-02-3678
See also PB84-174150.

Keywords: *Textile industry, *Water pollution, Technology, Industrial waste treatment, Process charting, Design criteria, Performance evaluation, Economic analysis, Feasibility, Textile industry, Tables(Data), Circulation, Dyeing, *Waste water reuse.

The report gives detailed information on a variety of wastewater recycle/reuse technologies that allow textile finishing mills to reduce the volume of wastewater and the amount of pollutants discharged to publicly owned treatment works. (NOTE: Dyebath reconstitution is described separately.) Many of these technologies have been demonstrated full-scale, but only a few have become widely applied in the textile industry. Technical and economic factors affect the application of most of these technologies at a given mill; thus, each must be considered under its own mill-specific conditions. Included for each described technology are a description, its environmental benefits, recycle and treatment system schematics, design criteria, technical factors that limit or enhance its application, capital and yearly costs, factors that affect its economic feasibility, its current applications, and references for further information. The information in this report is based on a survey of the literature, discussions with equipment/process vendors and researchers, and engineering studies at six textile finishing mills. The six mills provide a good cross-section of the variety of products, fibers, manufacturing processes, and potential recycle/reuse technologies encountered in textile finishing. Volume 2 of the report consists of the six mill engineering reports.

PB84-174259/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Domestic Marketing Channels for Tomatoes,
W. A. Megahed, M. S. Zayed, and M. E. Ragab. Jul 83, 32p UCD/ADS/EWP-178
Contract AID-263-0041
Prepared in cooperation with Ain Shams Univ., Cairo (Egypt).

Keywords: *Marketing, *Tomatoes, *Egypt, Recommendations, *Packaging, Materials handling, Quality, Separation, Construction, Prices, Developing country application, Wholesale trade.

Problems of the fresh tomato marketing system were analyzed and recommendations made. The marketing system was found to suffer from the following factors: Underdeveloped methods of packing and handling, absence of grading and sorting, excessive loading and unloading which adversely affects quality, congested and inefficient wholesale markets, reshipment from wholesalers back to consumers in producing areas, and industry concentration at the wholesale level. Recommendations for improvement included the following: The feasibility of constructing new wholesale markets in large cities should be studied.

PB84-174283/GAA PC **A03**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Government Policy and International Trade in Cotton,
E. Monke, and L. D. Taylor. Dec 82, 38p UCD/ADS/EWP-113
Contract AID-263-0041
Prepared in cooperation with Arizona Univ., Tucson.

Keywords: *International trade, *Cotton, Market surveys, Demand(Economics), Egypt, Exports, Imports, Textile industry, Prices, Supply(Economics), USSR, China, Mathematical models, Global.

The paper analyzes the international market for cotton. Trade patterns and institutions in cotton trade were discussed for 1960-1980, and previous studies of the demand for cotton were reviewed and critiqued. A model was proposed in which international cotton trade was set in an institutional framework. That is, government cotton policy has been so pervasive in several countries, including Egypt, that the amount entering trade channels is not determined by world prices but by exogenous government decisions. Accordingly, the model attempts to capture the resulting distortions. The market was segregated into price-responsive countries and those in which exports (imports) are determined exogenously. Demand and supply for the price-responsive segment was estimated as usual and then related through a net export (import) identity to the other countries, balancing total world cotton trade.

PB84-174341/GAA PC **A03**/MF **A01**
Pathfinder Fund, Boston, MA.
Evaluating Small Grants for Women in Development,
J. F. Helzner. Jan 80, 44p AID-PN-AAJ-775
Contract AID/otr-147-79-43

Keywords: *Regional planning, *Women, *Research and development, Research projects, Developing countries.

This paper is a first attempt to suggest a methodology for evaluating projects made possible by small grants that are given for the general purpose of promoting the incorporation of women into the socioeconomic development process of their countries. It does not describe the evaluation of any actual ongoing projects or programs, but proposes a framework for thinking about the effect of those small grants. The framework proposed in this paper concentrates on the strengthening of women's groups, on the assumption that this is a small but important component in the total women in development picture.

PB84-175082/GAA PC **A05**/MF **A01**
American Public Health Association, Washington, DC.
Study of Economic Evaluation Procedures for Population-Related Projects.
Rept. for 1 Oct -30 Nov 79,
W. C. Robinson, and W. A. Schutjer. 1979, 89p AID-PN-AAJ-900
Contract AID/pha-C-1100

Keywords: *Population control, *Economic analysis, *Birth control, Contraceptives, Attitudes, Socioeconomic factors, Developing country application.

This report reviews the problems involved with the lack of clearly quantifiable benefits that make economic evaluation of population-related projects (PRP's) difficult. Discussion is given in turn to: (1) PRP's macroeconomic benefits (increases in per capita income and consumption) and microeconomic benefits (enabling individuals and societies to meet fertility goals); (2) PRP's direct outputs (provision of contraceptive services and efficient use of them) and indirect outputs (activities to provide knowledge of contraception and/or effect attitudinal changes towards it); (3) methods to evaluate the impact of these outputs on fertility reduction, including short-cut methods such as the couple-years of protection (CYP) method and more detailed analytical methods (none of which are wholly precise); (4) the need to distinguish short and long-term PRP benefits given the limited 3-5 year time-frame of most PRP's; and (5) the impact of projects having only indirect and long-term, but nevertheless real fertility effects, e.g., land reform projects.

PB84-175090/GAA PC **A04**/MF **A01**
International Center for Research on Women, Washington, DC.
Limits to Productivity: Improving Women's Access to Technology and Credit,
I. Schumacher, J. Sebstad, and M. Buvinic. May 80, 69p AID-PN-AAJ-919
Contract AID/otr-C-1801

Keywords: *Women, *Socioeconomic status, Credit, *Employment, Family relations, *Productivity, Developing country application.

Although increasingly responsible for the family's economic welfare, women tend to be denied access to new technology and credit, relegating them to low productivity levels, low status, and poor paying jobs. This paper analyzes constraints on women's access to technology and credit and offers recommendations for improving their position.

PB84-175157/GAA PC **A12**/MF **A01**
Department of Agriculture, Washington, DC.
Pea (A Widely Spread Grain Legume),
R. K. Makasheva. c1983, 275p TT-78-52017
Trans. from mono. Gorokh, Leningrad, 1973 by B. R. / Sharma. Sponsored in part by National Science Foundation, Washington, DC. Special Foreign Currency Science Information Program.

Keywords: *Leguminous plants, *Grains(Food), Plant genetics, Seeds, Production, Yield, History, Silage, Tolerances(Physiology), Grain crops, Cultivation.

The pea is a widely spread grain legume with many uses. This book presents botanical, morphological, biological and genetic data on the pea. Based on these data and the practical experience of farmers and scientific investigations, this book describes the agronomy, breeding and seed production of peas. The author provides interesting material on grain, vegetable and fodder varieties and the technology of pea cultivation.

PB84-175744/GAA PC **A06**/MF **A01**
Environmental Protection Agency, Research Triangle Park, NC. Office of Air Quality Planning and Standards.
Review of New Source Performance Standards for Grain Elevators.
Final rept.
Jan 84, 105p EPA-450/3-84-001

Keywords: *Air pollution, *Standards, Reviews, Cost analysis, Trends, Grain mills, Cargo transportation, National government, State government, Fugitive emissions.

This report reviews the current Standards of Performance for New Stationary sources: Subpart DD - Grain Elevators. Emphasis is given to the state of control technology, extent to which plants have been able to meet current standards, experience of representatives of industry and of EPA officials involved with testing and compliance, economic costs, environmental and energy considerations, and trends in the grain elevator industry. Information used in this report is based on data available as of March 1983.

PB84-176171/GAA MF**$5.75**
British Association for the Advancement of Science, London (England).
Selected Papers from the Annual Meeting of the British Association for the Advancement of Science Held at Brighton, England on August 22-26, 1983. Section E.
1983, 268p
See also PB84-176163 and PB84-176189.
Also available in set of 19 reports MF E99, PB84-176106. Microfiche copies only.

Keywords: *Scientific societies, Technology innovation, *Demography, Disasters, Developing countries, Populations.

Complete papers are included unless otherwise noted: The Death of the Urban Vision (summary only); Will the Real Milton Keynes Please Stand Up; Some Current Developments and Progress in Flood Hazard Research; Deforestation and Disaster in the Garhwal Himalaya, India; Disaster Research - Ten Years On; Planning for People; Demographic Change and Social Provision in Western Europe; Residential Movement Among the Poor - The Constraints on Housing Choice in Latin American Cities; Educational Provision and Demographic Change; Population Data for the Planning of Primary Schools in the Third World; Planning for Health Care Provision - The Local Dimension; North and South - Economic Links and Their Implications; The Development Process - North-South Experiences; Development of the Rural Economy - Spatial and Social Equity and A Diminution in the North-South Gap.

PB84-176254/GAA MF**$5.75**
British Association for the Advancement of Science, London (England).
Selected Papers from the Annual Meeting of the British Association for the Advancement of Science Held at Brighton, England on August 22-26, 1983. Section M.
1983, 96p
See also PB84-176247 and PB84-176262.
Also available in set of 19 reports MF E99, PB84-176106. Microfiche copies only.

Keywords: *Scientific societies, Technology innovation, *Agriculture, Developing nations.

Complete papers are included unless otherwise noted: Urban Growth and Agriculture; Woodlands and Agriculture; Conservation and Agriculture; Experimental Farming in Al Hassa Saudi Arabia; Problems and Priorities in Third World Resource Development; Towards a New World Pattern of Land Use; Biological Nitrogen Fixation and the Future of World Agriculture; Surmounting Salinity (abstract only).

PB84-176486/GAA PC **A06**/MF **A01**
National Research Council, Washington, DC.
Firewood Crops: Shrub and Tree Species for Energy Production - Volume 2.
Final rept.,
1984, 103p
Grant AID-DAN-5538-G-00-1023-00
See also PB81-150716. Library of Congress catalog card no. 80-83796.

Keywords: *Wood, *Fuels, *Forestry, Reforestation, Shrubs, Forest trees, Growth, Yield, Acclimatization, Pests, Plant diseases, Nitrogen fixation.

This book examines one part of the solution to the firewood crisis suffered by Third World countries: the selection of species suitable for cultivation in different climatic zones. The report does not delineate strategies for growing and using firewood, but provides general concepts and methods for planners and technicians to consider. In particular, multi-purpose trees are discussed: plants that adapt well to different sites, establish easily and require little care; plants that thrive in problem environments such as steep hillsides, low-nutrient or toxic soils, arid zones and tropical highlands; and plants that have characteristics such as nitrogen-fixing ability, rapid growth, ability to coppice, and high calorific value. In this report, 27 species are discussed.

PB84-176551/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Livestock Working Power in Egyptian Agriculture,
I. Soliman. Feb 83, 24p UCD/ADS/EWP-123
Contract AID-263-0041
Prepared in cooperation with Zagazig Univ. (Egypt).

Keywords: *Machine tools, *Farming, *Livestock, *Agricultural economics, *Egypt, Manpower, Output, Loads(Forces), Economic factors, Performance evaluation, Milk, Transportation, Cattle, Farms, Area, Developing country application, Donkeys.

The objectives of the study were (1) to examine the livestock work pattern as farm size changes, (2) to examine the relationships among human labor, livestock work, and machinery use as family size changes, and (3) to provide empirical estimates of the impact of livestock work-milk output, measuring its opportunity cost in lost milk production. First, since most animal power is used for transportation of inputs and outputs rather than direct farm production work, machinery may not replace animal power very rapidly. Second, although the machine-to-animal power ratio increased gradually with farm size, other power inputs ratios including machine-to-human labor did not.

PB84-176577/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Mechanization Issues in Egyptian Agriculture,
A. H. Abou-Sabe. Mar 83, 12p UCD/ADS/EWP-129
Contract AID-263-0041
Prepared in cooperation with Ministry of Planning (Egypt).

Keywords: *Agricultural machinery, *Agricultural economics, *Egypt, History, Tractors, Economic factors, Performance evaluation, Maintenance, Shortages, Farm crops, Developing country application.

The paper was delivered at the Seventh ADS economics workshop, February 1983, 'Mechanization Issues in Egyptian Agriculture.' Dr. Abou-Sabe identified the historical landmarks in agricultural mechanization in Egypt beginning with a report of motor tractor trials carried out in 1920. Many of the points made then are still valid today. The difference is that at that time Egypt and Europe were at about the same stage of mechanization with Egypt even taking a leading role. Other highlights were mentioned: Measures taken to aid the small farmer after the 1952 Revolution and the major effort by the Ministry of Agriculture to promote mechanization in 1958.

PB84-176593/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Seminar on Food Consumption and Economic Development in Rural Communities,
M. A. El-Shennawy. Sep 82, 15p UCD/ADS/EWP-061
Contract AID-263-0041

Keywords: *Food supply, *Agricultural economics, *Egypt, Rural areas, Economic development, *Nutrition, Economic factors, Nutritional deficiency diseases, Developing country application.

Malnutrition is basically an economic problem in that when people are poor, their level of nutrition is low, but then poor nutrition in turn lowers productivity and exacerbates poverty. Various government programs, such as food subsidies and nutritional education programs, attempt to break this cycle. The seminar paper describes research that will investigate the effectiveness of these programs in improving nutrition.

PB84-176601/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Food System Development in Egypt,
M. K. Hindy. Dec 81, 21p UCD/ADS/EWP-058
Contract AID-263-0041
Prepared in cooperation with Ministry of Agriculture (Egypt).

Keywords: *Food, *Agricultural economics, *Egypt, Marketing, Production, Economic factors, Government policies, Investments, Developing country application, Agricultural extension, Food security.

After analyzing the Egyptian food system--including production processing and marketing--in some detail, the paper concludes that integrated efforts at policy reform towards a more open market oriented economy are badly needed. The government has adopted important strategies: Giving investment priority to agriculture to achieve food security; intensifying agricultural resource use; improving agricultural price policy to increase farmer incentives; improving the agricultural marketing system; taking positive measures at providing agricultural inputs; and encouraging research and extension activities. Still, the Egyptian food system malfunctions; particularly, the marketing system. Predictions show the food gap to continue to worsen.

PB84-176619/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Conclusions and Recommendations from the Conference on the Development of Egyptian Agricultural Exports,
M. A. El-Shennawy. Apr 82, 10p UCD/ADS/EWP-072
Contract AID-263-0041
Prepared in cooperation with Ministry of Agriculture (Egypt).

Keywords: *International trade, *Agricultural economics, *Egypt, Exports, Project planning, Economic factors, Performance evaluation, Recommendations, Marketing, Developing country application.

In order to underline the problems hindering the development of Egypt's agricultural exports, to identify possible solutions, and to point out the main lines of a new strategy, a four-day conference was held in Dokki in 1981, attended by more than 150 people. The paper summarizes key points made during the four sessions and gives recommendations for change. First, administrative changes were recommended (details are given in the paper). A high council for agricultural exports should be established with the responsibility for formulating a general plan for exports and outlining ways to fulfill the plan. A special committee should be formed for each principal exportable product; committee plans should be reviewed by the high council.

PB84-176627/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Supply of Agricultural Machines in Egypt,
S. Imam, and M. Khalil. Mar 83, 13p UCD/ADS/EWP 128
Contract AID-263-0041
Prepared in cooperation with Zagazig Univ. (Egypt), and Ministry of Agriculture (Egypt).

Keywords: *Agricultural machinery, *Agricultural economics, *Egypt, Ownership, Maintenance, Economic factors, Supply(Economics), Manufacturing, Developing country application, Ownership.

In order to provide background for exploring the issues related to the supply of agricultural machinery, a large overview study was made. Information was presented about machine ownership in the old and new lands, repair and maintenance workshops at different levels, agents which deal with machines and spare parts at both district and governorate levels, and plants manufacturing and assembling agricultural machines in both the private and public sectors. Detailed information was given in each category and special problems were noted.

PB84-176684/GAA PC **A04**/MF **A01**
American Public Health Association, Washington, DC.
Primary Health Care Issues: Growth Monitoring,
W. McBeath, and S. Kessler. 1961, 74p AID-PN-AAK-119
Contract AID-DSPE-C-0053

Keywords: *Nutrition, *Health, Monitoring, *Children, Developing country application.

Growth monitoring (GM) of a child's nutritional status is an effective means of targeting appropriate curative and preventive intervention in occurring or predicted cases of malnutrition. This state-of-the-art review of GM shows planners how to maximize the benefits of GM through the use of anthropometric indicators, nutritional status classification systems, record-keeping systems, measurement tools, program organization, family education and the training of primary health care workers.

PB84-176742/GAA PC **A08**/MF **A01**
Instituto de Nutricion de Centro America y Panama, Guatemala City.
Simplified Health Care Program in Rural Guatemala: The Patulul Project,
H. L. Delgado, J. M. Belizan, V. E. Valverde, E. M. Giron, and R. E. Klein. 1980, 165p MONO-12, AID-PN-AAJ-921
Contract AID/ta-C/1224

Keywords: *Health planning, *Rural areas, Developing countries, *Guatemala, Guidelines, *Nutrition, Preventive medicine, Developing country application, Patulul(Guatemala).

In 1976-77, the Institute of Nutrition of Central America and Panama (INCAP) adapted a previously developed simplified health care program for implementation in communities surrounding the town of Patulul, Guatemala. This report describes the Patulul experience--with special reference to program implementation, personnel training, quality control, and the development of preventive and curative care--and serves as a guide for groups interested in developing similar programs.

PB84-176866/GAA PC **A03**/MF **A01**
Agency for International Development, Washington, DC.
World Experience with Use of IUDs (Intrauterine Devices),
J. J. Speidel, and R. T. Ravenholt. Jun 79, 26p AID-PN-AAK-072
Presentation to the International Symposium Medicated IUDS and Polymeric Delivery Systems, Amsterdam, Holland held on June 27-30, 1979.

Keywords: *Contraceptives, *Birth control, *Family planning, *Women, Developing country application.

Nearly two decades of contraceptive experimentation and research reveals that successful use of intrauterine devices (IUD's) depends on a complex interplay of factors, including the IUD itself, biological variation among women, cultural differences in tolerance of its side effects, and the quality of available medical care and follow-up services. This report reviews past experience with the use of IUD's and assesses their future role in developing country family planning. The simplicity and inexpensiveness of IUD's made them popular during the early years of developing country family planning programs. From 1962 to 1967, 60-65% of new acceptors in national programs used IUD's. Shortly afterward, however, difficulties arose in both the type of programmatic support and follow-up care offered and in the appropriateness of the device itself.

PB84-176932/GAA PC **A07**/MF **A01**
Iowa State Univ., Ames. Dept. of Economics.
Agrarian Reform, Agricultural Planning, and Economic Development in Peru.
Final rept. 19 Sep 61-1 Oct 80,
J. F. Timmons. Sep 81, 141p INTERNATIONAL STUDIES IN ECONOMICS MONO-13, AID-PN-AAK-037
Contract AID/lac-C-1069
Sponsored in part by International Cooperation Administration, Washington, DC.

Keywords: *Peru, *Economic development, *Agriculture, *Land use, Rural areas, Land use, Personnel development, Employment, Developing country application, Recommendations.

From 1961 to 1977, A.I.D. funded four contracts with Iowa State University and Iowa University to provide technical assistance, training, and research to further Peru's agricultural and economic development. Each contract, the experiences and accomplishments of which are summarized in this report, emphasized training Peruvians to become self-sufficient in development planning and conducting research relevant to Peruvian development issues. The first contract analyzed agrarian reform's economic and legal aspects and the conditions necessary for its implementation. Three major avenues were studied--increasing nonfarm employment opportunities; extending cropland through irrigation, clearing, drainage, and colonization; and shifting land ownership from large holders to Indian colonos--and three prerequisites for progress were identified--the provision of capital and technical assistance and the enactment of institutional changes. Among the authors' recommendations are that: (1) A.I.D. continue to help universities serve the needs of developing countries; (2) universities make their training more applicable to developing country situations; and (3) developing country students who receive U.S. training be encouraged to return to their native countries. A list of program publications is among the five appendices.

PB84-176940/GAA PC **A07**/MF **A01**
Soil Conservation Service, Washington, DC. Soil Management Support Services.
Calculated Soil Moisture and Temperature Regimes of South America.
Technical monograph,
A. Van Wambeke. Nov 81, 146p SMSS/TECHNICAL MONO-2/1981, AID-PN-AAJ-979
Prepared in cooperation with New York State Coll. of Agriculture and Life Sciences, Ithaca.

Keywords: *Plants(Botany), *Soils, *Tropical regions, *South America, Tables(Data), Mathematical models, Plants, Taxonomy, Soil classification, Seasonal variations, Argentina, Bolivia, Brazil, Chile, Columbia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Surinam, Uruguay, Venezuela, Developing country application.

Soil moisture regimes (SMR's)--tables providing quantitative data on soil moisture and temperature--can aid in land use planning by defining soil limitations on plant growth, creating kingdoms within the soil classification system, and facilitating the preparation of generalized soil maps. This report uses a mathematical model developed by F. Newhall (a rough method designed to identify moisture regimes in areas where climatic and other input data are limited) to calculate SMR's for 1,100 stations throughout South America. The model is limited as data is often averaged over a period of years; SMR's do not include topsoil in calculations, resulting in a lack of knowledge on the availability of water for plants; and losses/gains in rainfall from poor drainage conditions are not measured.

PB84-176973/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Sampling Design for Commodity Systems Analysis Surveys in Egypt,
H. M. Abd-Samie, and A. A. Montaser. Jan 83, 45p UCD/ADS/EWP-107
Contract AID-263-0041
Prepared in cooperation with Al-Azhar Univ., Cairo (Egypt).

Keywords: *Vegetables, *Cost benefits, *Agricultural economics, *Egypt, Wheat, Potatoes, Economic factors, Performance evaluation, Cost estimates, Budgeting, Cluster sampling, Developing country application.

The paper outlines a recommended sampling design for surveying commodity systems in developing countries, such as Egypt, to be used for analysis. As an illustration of the method, Egyptian wheat and potatoes were used. The first step of the two-stage cluster, sampling procedure is to divide the population into nonoverlapping, exhaustive subgroups or strata. Each stratum is to be as homogenous as possible, yet significantly different from other strata. This procedure greatly increases the precision of estimates. Next, each stratum is divided into clustered sampling units. The sample size to use can be determined from the survey budget, the estimated cost per unit surveyed, and the desired precision level.

PB84-176981/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.

Farm Mechanization Policy in Egypt,
S. A. Imam, and M. Khalil. Jan 83, 36p UCD/ADS/EWP-118
Contract AID-263-0041
Prepared in cooperation with Zagazig Univ. (Egypt).

Keywords: *Agricultural machinery, *Agricultural economics, *Egypt, Shortage, Manpower, Economic factors, Performance evaluation, Government policies, Developing country application.

Recently, farm mechanization in Egypt has been stimulated by a labor shortage and high wages resulting from demand for workers in other sectors and other countries. Agricultural policy aims to increase output, raise rural incomes, and improve income distribution; mechanization is seen as a means to achieve these ends. The paper discussed Egypt's farm mechanization policy, its targets and goals and its current status. Included were details about plans for expansion of mechanization.

PB84-176999/GAA PC **A13**/MF **A01**
International Crops Research Inst. for the Semi-Arid Tropics, Patancheru (India).
Proceedings of the International Workshop on Chickpea Improvement Held at Hyderabad, India on February 28-March 2, 1979.
1979, 292p AID-PN-AAJ-880

Keywords: *Leguminous plants, *India, Recommendations, Plant genetics, Plant reproduction, Fungi, Hybridization, Seeds, Plant physiology, Tables(Data), Field tests, Developing country application.

New approaches to breeding of chickpeas (CP's) require increased cooperation between national and international breeding programs. In 1979, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) sponsored an international seminar at Hyderabad, India to review ICRISAT's research on CP improvement and to discuss the merits of new breeding techniques. Topics discussed at the seminar, whose proceedings are presented in this report, were: breeding strategies; yield improvement through Kabuli-Desi introgression; CP agronomy, physiology, and microbiology; and breeding at the national level.

PB84-177005/GAA PC **A04**/MF **A01**
International Center for Research on Women, Washington, DC.
Productivity of Women in Developing Countries: Measurement Issues and Recommendations.
Apr 80, 51p AID-PN-AAJ-229
Contract AID/otr-C-1801

Keywords: *Women, *Education, *Productivity, *Employment, Households, Developing country application, Labor force.

By virtually ignoring household production and by undercounting female participation in the marketplace, labor force data consistently underrate women's contribution to Third World economies. As a result, policymakers resist the notion of women as economic beings. This report analyzes measurements of women's economic activities, discusses limits to these measures, and recommends improvements.

PB84-177013/GAA PC **A04**/MF **A01**
Pathfinder Fund, Boston, MA.
Women's Development Projects and Fertility Change: Suggestions for Assessing Field Experience.
K. B. Piepmeir. Jun 80, 63p AID-PN-AAJ-696
Contract AID/otr-147-79-105

Keywords: *Women, Project appraisal, *Fertility, *Socioeconomic status, *Employment, Health, *Children, Education, Developing country application.

Recognition of the importance of socioeconomic factors as determinants of fertility has recently led both governmental and private family planning agencies to undertake community-level projects aimed at reducing fertility by enhancing women's socioeconomic status. This paper examines the rationale behind such socioeconomic strategies and offers recommendations with regard to their implementation and evaluation.

PB84-177039/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Appraisal of Poultry Feed Policy in Egypt,
I. Soliman, and A. Ibrahim. Apr 83, 14p UCD/ADS/EWP-137
Contract AID-263-0041
Prepared in cooperation with Zagazig Univ. (Egypt).

Keywords: *Poultry, *Agricultural economics, *Egypt, Appraisals, Production, Economic factors, Performance evaluation, Feeding stuffs, Supply(Economics), Developing country application.

Along with the great expansion in poultry production went greatly increased poultry feed production (most of the feed ingredients are imported). Still, serious problems exist with the feed supply including deficient supplies, irregular deliveries, quality problems, and transportation difficulties--according to a survey of 32 producers in the Sharkia Governorate. The broiler industry operates amidst general confusion and disincentives resulting from multiple interventions by the government. The high feed-conversion ratios found on the survey are an indication of where efficiency in broiler production could be improved, greatly enhancing the prospects of the industry.

PB84-177047/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Egyptian Food Security: An Optimization Approach,
A. H. Sarris. Aug 82, 30p UCD/ADS/EWP-096
Contract AID-263-0041
Prepared in cooperation with California Univ., Berkeley.

Keywords: *Food supply, *International trade, *Food, *Agricultural economics, *Egypt, Mathematical models, Government policies, Optimization, Economic factors, Performance evaluation, Marketing, Nonlinear programming, Developing country application, Food security.

Although many aspects of the food and agricultural policy in Egypt are done in the name of national food security, the concept itself is vague and the goals of the various Ministries are inconsistent with each other and work at cross purposes, all in the name of national food security. The study presents an empirical 'food security' model in which domestic food requirements must be met while incurring the smallest possible foreign exchange expenditure and the smallest possible agricultural balance of trade. Quadratic programming was used to simulate cropping patterns by region for 19 internationally traded commodities under several alternative scenarios. Results, while preliminary, suggest that the drive toward self-sufficiency in staple food grains at the expense of nonprofitable cash crops is justified when risk is taken into consideration.

PB84-177088/GAA PC **A07**/MF **A01**
Chemonics International Consulting Div., Washington, DC.
Status of Bovine Trypanosomiasis and Seasonal Variation in Its Occurrence in Zone 1 (Niger Valley) of the Republic of Mali,
M. A. Q. Awan, S. Maiga, S. Bouare, and A. Telly. Jul 81, 147p AID-PN-AAJ-718
Sponsored in part by Ministere de l'Elevage et des Eaux et Forets, Bamako (Mali).

Keywords: *Mali, *Animal diseases, Seasonal variation, Infectious diseases, Parasitic diseases, Niger Valley, Bovines, Developing country application.

Trypanosomiasis (sleeping sickness), inflicted by the prolific tsetse fly, is a major constraint to the development of the cattle industry in Mali. This report, responding to the paucity of scientific evidence on the extent of tsetse infestation, investigates the tsetse presence in 110 villages in Zone 1, a portion of southwest Mali along the Niger River. Three types of diagnostic examination were used--thick blood smears, thin blood smears, and lymph node biopsy smears, with the latter found to have the most diagnostic utility. Factors limiting the experiment's success were the presence of trypanosome-resistant cattle and the widespread use of trypanocides by farmers.

PB84-177096/GAA PC **A04**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Role of Livestock Production on the Egyptian Farm,
I. Soliman, J. B. Fitch, and N. A. El Aziz. Jul 82, 55p UCD/ADS/EWP-085
Contract AID-263-0041
Prepared in cooperation with Zagazig Univ. (Egypt), Agrimanagement (Egypt), and Ministry of Agriculture, Cairo (Egypt).

Keywords: *Farming, *Livestock, *Agricultural economics, *Egypt, Production, Farms, Economic factors, Performance evaluation, Feeding(Supplying), Manpower, Area, Dairies, Developing country application, Feedlots.

In contrast to the tendency of livestock researchers to focus on large-scale feedlots and dairies and use technical coefficients derived from national aggregate secondary statistics, the study attempted to clarify the role of livestock on the traditional Egyptian farm which jointly produces crops and livestock. The objectives of the study were to identify the production structure and technical coefficients for traditional farms by examining feeding practices, output quantities and distribution, economic costs, benefits, and returns. Particular attention was paid to the interface of crop and livestock production, the role of family labor, and identification of how factors vary by farm size.

PB84-177104/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Wages, Prices, and Farm Mechanization in Rural Egypt: The Need for an Integrated Policy,
A. de Janvry. Sep 82, 41p UCD/ADS/EWP-095
Contract AID-263-0041
Prepared in cooperation with California Univ., Berkeley.

Keywords: *Agricultural machinery, *Agricultural economics, *Egypt, Prices, Rural areas, Economic factors, Performance evaluation, Developing country application.

Policies too often entail unintended consequences because (1) the basis of analysis is only a partial one; (2) decisions are made under political pressures, not by analysis at all; and (3) responses are short-run reactions to crises. Like those of many countries, Egypt's agricultural and food policies are of this partial and piecemeal nature; yet, their consequences on economic growth may be more severe than in other countries because of the pervasiveness of government intervention. What is needed is a better understanding of the interrelatedness of the effects of the various policies that can serve as a basis for an integrated approach to policymaking.

PB84-177179/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Some Observations on Livestock Policies in Egypt With Special Reference to Credit and Import Policies,
I. Soliman, M. A. El-Azim, and F. Habib. Apr 83, 21p UCD/ADS/EWP-135
Contract AID-263-0041
Prepared in cooperation with Zag

Keywords: *International trade, *Livestock, *Agricultural economics, *Egypt, Credit, Imports, Economic factors, Performance evaluation, Income, Government policies, Developing country application.

With increasing population and increasing per capita income, the demand for livestock products has exceeded domestic supplies. Imports have not been able to meet the gap; prices have been driven up beyond the reach of many. Meanwhile, animal protein intake needs to be augmented, particularly among the young and the rural poor. The dilemma has called for governmental intervention on several fronts. The two areas discussed in this paper are the credit policy and the import policy.

PB84-177195/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Selection of the Sample for the Food Consumption Activity of 1981-82,
A. A. A. Mohamed, and M. A. El-Shennawy. Aug 82, 20p UCD/ADS/EWP-088

Contract AID-263-0041
Prepared in cooperation with the Ministry of Agriculture (Egypt).

Keywords: *Food supply, *Rural areas, Surveys, *Egypt, Developing countries, Developing country application, Poverty, Households.

The principal purpose of the consumption study activity is to depict consumption patterns of poor, rural landholder families who produce some of their consumption needs and purchase the rest. The paper describes the process of selecting a multi-staged, stratified, random sample of 245 households to be subsequently interviewed about consumption patterns. The households were selected from five regions of Egypt: the rice zone, the traditional crop zone in the Delta, the fruit and vegetable zone, the traditional crop zone in mid-Egypt, and the sugarcane zone.

PB84-177211/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Statistical Techniques for Estimating California Poultry Numbers, 1983,
J. H. Cothern, and S. McManigal. Jun 83, 30p UCD/ADS/EWP-181
Contract AID-263-041

Keywords: *Poultry, *Agricultural economics, *Egypt, Surveys, Estimating, Production, Economic factors, Interviews, Tables(Data), Statistical analysis, Developing country application.

A team of Egyptian economists has been conducting a survey of Egyptian poultry-producing firms by size, number, and location. To guide them in evaluating the poultry information gathered, this report discusses the methodology used by the California Crop and Livestock Reporting Service (CCLRS) in its periodic surveys of poultry producers and its statistical publications based on these surveys. This review of CCLRS methods reveals that with a systematic and comprehensive effort, high quality statistical poultry information may be assimilated, evaluated, and disseminated.

PB84-177278/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Measures Suggested by Fellahin to Improve Their Well-Being,
M. A. El-Shennawy, A. Treffeisen, and S. Lane. Jun 83, 30p UCD/ADS/EWP-165
Contract AID-263-0041
Prepared in cooperation with Ministry of Agriculture (Egypt), and California Univ., Berkeley.

Keywords: *Economic development, *Agricultural economics, *Egypt, Income, Surveys, Interviews, Economic factors, Distribution(Property), Food, Distribution systems, Feeding stuffs, Cattle, Shortages, Flour mills, Developing country application, *Cooperatives.

In 1981-82, as part of the ADS Economics Food Consumption Activity, 249 fellahin were asked open-ended questions designed to elicit their perceptions about ways to (1) increase their incomes, (2) increase output on their farms, and (3) improve the nutritional status of their families. Replies were tabulated, categorized, and analyzed. The most popular suggestion was the establishment of more retail cooperative society stores, amply supplied with reasonably priced food. It seems what is needed is not just more food but an improved food distribution system. The second, third, and fourth most frequently mentioned suggestions were: (1) building more mills to grind grain in the villages, (2) increase the cottonseed cake quota for cattle to alleviate the serious shortage of cattle feed, and (3) make improved seeds more readily available.

PB84-177401/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Two Papers on Consumption and Nutrition in Rural Egypt,
A. I. Abdou. Jun 82, 28p UCD/ADS/EWP-079
Contract AID-263-0041
Prepared in cooperation with National Research Center, Dokki (Egypt).

Keywords: *Food supply, *Nutrition, *Egypt, Surveys, Developing countries, *Rural areas, Nutritional deficiency diseases, Farm crops, Developing country application.

The first paper presents an overview of food consumption in rural Egypt and reviews various proposals to improve the situation. Despite vastly increased imports of wheat and maize, malnutrition persists and is most critical in rural areas. Apparently, the problem is more one of maldistribution than of a shortage in aggregate supply. An integrated plan is needed to meet this food crisis. Other measures to alleviate the situation include increasing maize production, devoting newly developed land at Lake Nasser to fodder, replacing cotton acreage with corn and rice, introducing byproducts into animal feed, increasing credit and input subsidies to farmers, redistributing income toward the poor, and providing nutritional supplements in various food mixtures including flour. The second paper reviews food consumption patterns in various rural regions of Egypt and finds them highly heterogeneous, with the variations in diet closely associated with variations in production patterns.

PB84-177427/GAA PC **A07**/MF **A01**
Food and Agriculture Organization of the United Nations, Rome (Italy).
Food, Nutrition, and Agriculture: Guidelines for Curriculum Content for Agricultural Training in Southeast Asia.
Apr 81, 150p PN-AAJ-664
Sponsored in part by Philippines Univ. at Los Banos.

Keywords: *Training, *Agriculture, *Southeast Asia, *Nutrition, Food habits, Nutritional deficiency diseases, Developing countries, Indonesia, Malaysia, Philippines, Thailand, Farms, Production, Developing country application, Curricula.

Educating farmers in the relationship between agricultural production and human nutrition has been suggested as one way of resolving the paradox currently occurring in Southeast Asia of simultaneous increases in food production and malnutrition. This report presents guidelines for a one semester undergraduate course in human nutrition for students and teachers of agriculture and for in-service training of agricultural extension workers in Indonesia, Malaysia, the Philippines, and Thailand. The objective of the course is to help future extensionists, as members of the rural development team, to better assist farmers in growing food sufficient in quantity and quality to meet family nutritional needs and to increase farmer income.

PB84-177435/GAA PC **A06**/MF **A01**
Agency for International Development, Washington, DC.
Mejoramiento de las Viviendas Rurales en la Republica Dominicana para Resistir los Huracanes y Terremotos (Improvement of Rural Housing in the Dominican Republic to Resist Hurricanes and Earthquakes).
Apr 81, 121p AID-PN-AAK-036

Keywords: *Earthquake engineering, *Dominican Republic, Developing countries, Rural areas, Hurricanes, *Houses, Design, Recommendations, Developing country application.

Devastation wrought by hurricanes and earthquakes causes serious housing shortages and high reconstruction costs in the Dominican Republic (DR). This study offers alternative construction methods and housing design modifications to improve the resistance of the DR's rural housing to natural disasters and to make housing more accessible to the rural poor.

PB84-177518 Not available NTIS
Ecological Research Associates, Davis, CA.
Use of Artificial Wetlands to Remove Nitrogen from Wastewater.
Journal article,
R. M. Gersberg, B. V. Elkins, and C. R. Goldman.
c1984, 9p EPA-600/J-84-008
Grant EPA-R-807299
Prepared in cooperation with San Diego Water Reclamation Agency, Santee, CA., and California Univ., Davis. Div. of Environmental Studies.
Pub. in Jnl. of Water Pollution Control Federation, v56 n2 p152-156 Feb 84.

Keywords: *Aquaculture, *Sewage treatment, *Nitrogen, Substitutes, Water quality, Biomass, Cost analysis, Biochemical oxygen demand, Methyl alcohol, Plants(Botany), Vegetation, Reprints, *Waste water reuse, Santee(California).

Studies of artificial wetlands at Santee, California, focused on nitrogen removal from municipal wastewaters using lower-cost alternatives to methanol to supply carbon to drive denitrification. Using plant biomass, mulched and applied to the surface of the artificial marsh beds, mean removal efficiencies were 89% for TN at an application rate of 8.4 - 12.5 cm per day and 65% for TN at an application rate of 17 - 20 cm per day.

PB84-177674/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Economic Implications of the Policy for Pricing and Allocating Rice in Egypt,
S. M. Ali, and B. D. Gardner. Jul 82, 37p UCD/ADS/EWP-084
Contract AID-263-0041
Prepared in cooperation with Zagazig Univ. (Egypt).

Keywords: *Rice, *Agricultural economics, *Egypt, Grants, Distribution(Property), Economic factors, Government policies, Benefit cost analysis, Income, Marketing, Allocations, Resources, Demand(Economics), Developing country application, Scarcity.

The policy of heavily subsidizing and rationing rice in Egypt has significant distributive effects and especially benefits low-income consumers in both urban and rural areas. But the policy misallocates scarce resources into inefficient uses. The study attempts to measure the economic inefficiency involved so that policy makers may judge whether or not the distributive benefits are worth the efficiency costs. Using a partial equilibrium analysis, welfare losses involved in the government's rice policy were estimated under various assumptions about demand and supply elasticities. It was found that the existence of the free market for rice above and beyond the government-controlled portion of the crop is a strong mitigating force in reducing welfare loss since both producers and rural consumers increase their well being by using the free market to trade in rice. Still, pricing the rice quota far below the world market level discriminates against farm families and reduces their income.

PB84-177690/GAA PC **A04**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Public Policy and the Demand for Mechanization on Egyptian Farms,
C. H. Gotsch, and W. W. Dyer. Mar 83, 54p UCD/ADS/EWP-133
Contract AID-263-0041
Prepared in cooperation with Stanford Univ., CA.

Keywords: *Agricultural machinery, *Agricultural economics, *Egypt, Grants, Wages, Economic factors, Manpower, Energy, Taxes, Mathematical models, Demand(Economics), Farm crops, Winter, Summer, Planting, Developing country application.

Whether the movement away from animal power in a developing country is a sign of modernization or is inappropriate technologically, is an ongoing debate. The issue in Egypt's case presents particular difficulties. For example, the rise in real wages is often taken as a justification of capital-for-labor substitution. But increasing wages are to a considerable extent the result of emigration, which could be only temporary. In Egypt, mechanization is also being distorted by subsidies on energy and equipment as well as implicit taxes on crops. To make a modest contribution to the mechanization debate in the Egyptian context, an LP model was used to analyze the demand for various types of mechanical technology under both current and hypothetical conditions.

PB84-178458/GAA PC **A04**/MF **A01**
Texas Univ. at El Paso.
Women's Organizations in Rural Development,
K. A. Staudt. Feb 80, 75p AID-PN-AAJ-773

Keywords: *Women, *Rural areas, Organizations, *Socioeconomic status, Incentives, Developing country application.

Unless politically empowered, women will remain marginal in development and the unequal recipients of its benefits. Against a review of women's generally disproportionate political standing, this paper discusses organizational strategies to increase women's political participation in developing countries. Conventional measures such as voting, recognition by development agencies, and active party membership reveal women's meager political involvement, as does the absence of female leadership of and adequate representation in political and bureaucratic activities. Strategies to reverse this situation--strategies which are needed even in countries professing 'emancipationist' ideologies--must take into account the type of political system. Women's political prospects increase to the degree that the system recognizes organizational, as opposed to socioeconomic, status as the basis for political activity and incorporates independent groups into the decisionmaking process. Economic and social incentives (e.g. income-earning projects and collective causes) are key means of helping women organize to satisfy both immediate and--if programs are well managed--long-term needs. Sixteen policy recommendations, based on the above analysis, are made regarding organizational strategies, employment/institutional strategies, and data collection. Key recommendations include financing women's organizations, e.g., through PVO's; providing incentives for official bureaucracies to employ women; and collecting pre-and post-project data on women's groups.

PB84-178474/GAA PC **A09**/MF **A01**
Agency for International Development, Washington, DC.
Tanzania Health Sector Strategy,
A. E. Henn. Feb 80, 185p AID-PN-AAJ-899

Keywords: *Health planning, Nutrition, Public health, Programs, Policies, Africa, *Tanzania, Developing country application, *Health care delivery, Health status, Health care requirements, Goals.

By sacrificing the possibility of more rapid economic growth, the Government of Tanzania (GOT) is developing a health care system to meet the immediate health needs of its people. To assist in the effort, this report reviews Tanzania's health sector and serves as a background against which USAID/T health, nutrition, and population projects can be designed and evaluated. Reviewed are the population's general health status; health sector organization and GOT sector policies and programs; sector contributions from donors, PVO's, the private sector, and traditional medicine; main sector constraints; and the GOT's future sector plans.

PB84-178730/GAA PC **A08**/MF **A01**
Water and Sanitation for Health Project, Arlington, VA.
Social and Economic Preconditions for Water Supply and Sanitation Programs.
Technical rept.,
D. B. Warner. Nov 81, 169p WASH/TR-10, AID-PN-AAJ-903
Contracts AID/DSPE-C-0080, AID/otr-147-80-101

Keywords: *Water quality, *Sanitation, *Socioeconomic status, *Water pollution, Mathematical models, Guidelines, Technology, Assessments, Public health, Technology, Management planning, Developing country application.

Community water supply and sanitation (CWSS) projects in developing countries often lead to only transitory adoption of sanitary and healthy behavior due to a failure to incorporate beneficiaries' socioeconomic needs and capabilities into project design. This study is designed to assist A.I.D. personnel and development planners in understanding the importance of social and economic preconditions in CWSS projects and to identify such preconditions in the field. A five step model is provided for identifying and assessing relevant preconditions for CWSS project formulation: (1) identify the area's CWSS needs and the development objectives of the community, domestic government, and USAID (e.g., a goal to promote self-help efforts and appropriate technology transfers); (2) determine the community's socioeconomic status and existing water and sanitation facilities by using composite indices (e.g., the Physical Quality of Life Index) to compare national development data; (3) select appropriate levels of water and sanitation technology (e.g., define a socially feasible technology hierarchy); (4) determine required support conditions attendant to technology (e.g., training, infrastructure, and maintenance); and (5) predict short-and long-term project impacts (e.g., behavioral and institutional changes). For practical use in areas which have never experienced formal program designs, this general theoretical framework must be field-tested to fit site-specific CWSS situations. In designing specific CWSS projects, the authors recommend that from the general preconditions presented here, CWSS planners choose to address those most related to national objectives and those for which institutional support will most likely be available. Intervention sites can then be selected and the nature and scope of the intervention can be determined according to perceived community needs and available resources. A 67-item bibliography (1953-81) is appended.

PB84-179084/GAA PC **A11**/MF **A01**
Practical Concepts, Inc., Washington, DC.
Rural Development in the 1980's: Executive Summary and Conference Proceedings Report on the International Conference Held at the Shenandoah National Park, Virginia in November 1979.
Nov 79, 249p AID-PN-AAJ-884

Keywords: *Farming, *Rural areas, *Regional planning, *Project planning, Meetings, Farms, Social services, Developing countries, Developing country application.

In 1979 A.I.D. sponsored an international conference on the challenge of poverty and rural development in the 1980's. The proceedings of the conference, here presented, include conference workshop deliberations, formal and panel presentations, and special sessions. Also presented is an executive summary providing the main consensus points about rural development projects: (1) projects do not take place in a policy vacuum; (2) decisionmaking should be decentralized to strengthen local capacities; and (3) personnel from many disciplines should be involved. In response to the above points participants recommend that donor agencies: (1) encourage local participation in all project stages; (2) keep project implementation responsibility at the lowest possible level; (3) weigh the trade off of short-run costs and benefits and long-run social benefits and burdens; and (4) shorten the time between project identification and implementation. Summaries of seven workshops cover technical deliberations, organization and mobilization issues, conclusions, and recommendations. Topics were small farmer and rural household production systems; rural financial markets; market access, agricultural pricing, and food distribution; rural enterprises and off-farm employment; rural public works; providing social services in rural areas; and development of and access to natural resources.

PB84-179092/GAA PC **A04**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Outflow of Labor from Agriculture: A Framework for Analyzing Migration from Rural Areas,
A. Seifelnasr. Aug 81, 53p UCD/ADS/EWP-033
Contract AID-263-0041

Keywords: *Rural areas, *Migration, *Egypt, Developing country application, Labor force, Socioeconomic factors, Households.

The paper examines the context and determinants of rural migration with particular emphasis on the interaction between demographic and agricultural-related variables. Since migration, a demographic phenomenon with both consumption and production overtones, tends to be a family rather than an individual decision, the family as a decision-making unit received special emphasis in the paper. The setting for migration is described by four sets of variables at the village level: (1) the level and pattern of labor utilization, (2) the level of agricultural technology, (3) the level and distribution of resources within the village, and (4) the extent of the village's integration into the outside world. Although the setting determines the volume of migration, the individual's propensity to migrate is influenced by the socio-economic position of the family and the type of family organization. To describe the causal relationships determining migration and to increase the policy relevance of the results, a two-level analysis of migration--at the village level and the household level--is provided.

PB84-179100/GAA PC **A04**/MF **A01**
Auburn Univ., AL.
State-of-the Arts Paper (SOAP) on Techniques of Enumeration of Intercropping and Associated Cultivation and Livestock Numbers and Products in Subsistence Agriculture in LDC's,
J. O'Sullivan. 1980, 59p AID-PN-AAH-956
Contract AID/afr-C-1607

Keywords: *Agriculture, *Livestock, *Crops, Farm crops, Food, Interviews, Developing country application.

Unlike highly-developed economies with a high degree of commercial agriculture, subsistence agriculture in developing countries poses special enumeration problems--cropping systems are often complex and nonstandardized, farmer illiteracy often precludes the use of mail questionnaires, educated enumerators are lacking, etc. This state-of-the-arts-paper, based on a literature review and interviews with experienced U.S. personnel, reviews techniques currently used in developing countries for enumerating area and production in intercropped (two or more crops growing simultaneously in the same plot) or associated cultivation (e.g., triple cropping) and for enumerating livestock and livestock products.

PB84-179126/GAA PC **A05**/MF **A01**
American Public Health Association, Washington, DC. International Health Programs.
Environmental Sanitation and Integrated Health Delivery Programs,
D. W. Schnare, G. W. Miller, and C. S. Pineo. 1981, 92p MONO SER-4, AID-PN-AAJ-887
Contracts AID/ta-C-1320, AID/DSPE-C-0053

Keywords: *Environmental impacts, *Diseases, *Health care delivery, *Sanitation, Preventive medicine, Developing countries, Potable water, Water supply, Communities, Project management, Hygiene, Developing country application.

The incidence of many major diseases which plague developing countries could be minimized through proper environmental sanitation (ES) practices such as excreta disposal, water purification, personal hygiene, and immunization. This study outlines a strategy for incorporating ES into integrated health delivery programs.

PB84-179134/GAA PC **A03**/MF **A01**
Agency for International Development, Washington, DC.
Approaches to Appropriate Agricultural Technology in Egypt: A Special Case Study Evaluation,
R. W. Pearson. 25 Oct 81, 39p AID-PN-AAJ-891

Keywords: *Agriculture, *Productivity, *Technical assistance, *Egypt, *Agricultural economics, Comparison, Research projects, Turkey, Pakistan, Prototypes, Tractors, Agricultural machinery, Rural areas, Recommendations, Education, Financing, Technical assistance, Developing country application.

Appropriate agricultural technologies (AAT) could greatly improve Egypt's agricultural production. This paper compares successful AAT projects in Turkey and Pakistan with ongoing efforts in Egypt, particularly the AID-funded Small Scale Agricultural Activities Project (SSAA), identifying points of commonality and developing a generalized approach to AAT.

PB84-179167/GAA PC **A05**/MF **A01**
California Univ., Davis.
Agricultural Development: Present and Potential Role of Edible Wild Plants. Part 1. Central and South America and the Caribbean,
L. E. Grivetti. Nov 80, 84p AID-PN-AAJ-688-PT-1
Contract AID/otr-147-80-87
See also Part 2, PB84-179175.

Keywords: *Agriculture, *Latin America, *Plants(Botany), *Food, *Tropical regions, Selection, Diets, Feasibility, Central America, South America, *Caribbean, Nutritional value, Botany, Developing country application.

This three-volume, AID-sponsored study on the feasibility of using edible wild plants for food in developing country tropical areas assesses the potential role of edible wild plants in Central and South America, and the Caribbean, Oceania, East and Southeast Asia. Based on a search of available literature published in the last 150 years, the report documents dietary uses for wild plants, identifies the nutritional importance of selected species, and examines the potential for research and development.

PB84-179175/GAA PC **A08**/MF **A01**
California Univ., Davis.
Agricultural Development: Present and Potential Role of Edible Wild Plants. Part 2. Sub-Saharan Africa,
L. E. Grivetti. Nov 80, 154p AID-PN-AAJ-688-PT-2
Contract AID/otr-147-80-37
See also Part 1, PB84-179167.

Keywords: *Plants(Botany), *Food, *Tropical regions, Selection, Diets, Feasibility, *Subsaharan Africa, Nutritional value, Botany, Developing country application, Oceania.

This three-volume, AID-sponsored study on the feasibility of using edible wild plants for food in developing country tropical areas assesses the potential role of edible wild plants in Central and South America and the Caribbean (Volume I), Sub-Saharan Africa (Volume II), and India, Oceania, East and Southeast Asia (Volume III). Based on a search of available literature published in the last 150 years, the report documents dietary uses for wild plants, identifies the nutritional importance of selected species, and examines the potential for research and development.

PB84-179225/GAA PC **A05**/MF **A01**
American Public Health Association, Washington, DC. International Health Programs.
Health Care Financing in Developing Countries,
D. K. Zschock. 1979, 89p MONO SER-1, AID-PN-AAG-636
Contract AID/ta-C-1320

Keywords: *Financial management, *Health planning, Developing countries, Developing country application.

Defining health care as 'activities specifically intended to reduce morbidity and mortality', the study first analyzes the determinants of demand for health care (e.g., health status, income, education, cost, and accessibility). Next, the sources and merits of funding from public sources and private sources are considered and various analytical models of and evaluation criteria for health care financing methods are presented. Lastly, various systemic and five case studies of health care financing are reviewed.

PB84-179233/GAA PC **A03**/MF **A01**
Minnesota Univ., St. Paul. Dept. of Agricultural and Applied Economics.
Issues in Irrigation Planning and Development.
Staff paper,
K. W. Easter. Jan 80, 37p P80-5, AID-PN-AAJ-925
Contract AID/ne-C-1507

Keywords: *Irrigation, *Water management, Performance evaluation, Design criteria, Substitutes, Management planning, *Ground water, Farms, *Economic analysis, Developing country application.

Of the numerous irrigation planning and development issues facing developing countries, four are addressed in this report: (1) water allocation methods; (2) irrigation project implementation and rehabilitation; (3) alternatives for design, scale, and distribution of irrigation investments; and (4) improving system-wide performance. As to irrigation policy alternatives, small-scale projects (i.e. tank irrigation) appear desirable but more information is needed to determine their viability, performance, and operation in the field. To improve system-wide performance, more research is needed on the joint operation of surface and groundwater supplies to ensure optimum use of available water sources, the management of irrigation systems which draw from the same groundwater source, and the effects of certain government policies on the rate at which ground water is drawn. Appended is a 24-item bibliography (1963-78).

PB84-179571/GAA PC **A05**/MF **A01**
Puerto Rico Univ., Rio Piedras. Agricultural Experiment Station.
El Mercado de Trabajo en la Agricultura y las Caracteristicas Socio-Economicas de los Obreros Agricolas en Puerto Rico (Agricultural Work Market and the Socioeconomic Characteristics of Agricultural Workers in Puerto Rico),
J. Z. Acosta, J. L. Troche Ducot, E. D. Lube, and V. C. Figueroa. Oct 83, 95p PUB-148
Text in Spanish.

Keywords: *Economic analysis, *Socioeconomic status, *Agriculture, Salaries, Puerto Rico, Labor market, Developing country application, Socioeconomic conditions.

During the last three decades Puerto Rico has shown a decline in the number of agricultural workers employed, relatively low wages compared to non-farm workers, and labor input a high proportion of the cost per unit of crop harvests. Sugar, coffee, and tobacco production has decreased while animal production increased. Government subsidies for farm workers have also increased in the last 20 years. The study found that the decline in the production of various crops, the reduction of the area under cultivation, and the decline in the supply of farm workers are some of the main factors that limit the agricultural development in Puerto Rico. Under the premise that the availability of human resources is fundamental to alleviate said situation, wages must be increased and working conditions must be improved to attract laborers to the agricultural sector. The government provides subsidies and incentives (50.5 million in 1978-79) that are channeled with emphasis toward two main purposes: (1) higher agricultural production and (2) an adequate farm labor supply. The conditions that depress the agricultural development in Puerto Rico lead to the conclusion that said government assistance should be evaluated as to the degree in which it is accomplishing its important objectives. The wage subsidy for agricultural labor in 1978-79 represented around half of the total government expenditures in agricultural subsidies and incentives.

PB84-179696/GAA PC **E09**/MF **E01**
Swedish Council for Building Research, Stockholm.
Salts in Soil and Water Within the Arid Climate Zone: Effects on Engineering Geology-with Examples from Saudi Arabia,
K. Jergman. 1984, 191p ISBN-91-540-4067-1, D6:1984

Keywords: *Water quality, *Deserts, *Soils, Thesis, Groundwater.

This thesis deals with the presence of salts in soil and water within the arid climate zone and their effects on engineering geology planning. In this field, Sweden should be able to contribute to the building-up of a knowledge resource. Research can benefit various developing countries as well as Swedish companies with operations abroad within the arid climate zone. The material for this thesis has been accumulated successively and the VIAK company in Stockholm has been of primary importance.

PB84-179803/GAA PC **A11**/MF **A01**
Puerto Rico Univ., Rio Piedras. Agricultural Experiment Station.
Produccion y Utilizacion Intensiva de las Forrajeras en Puerto Rico (Production and Intensive Use of Grasslands in Puerto Rico),
J. Vincente-Chandler, R. C. Costas, F. Abruna, and S. Silva. Oct 83, 234p BULL-271
Text in Spanish.

Keywords: *Grass, *Livestock, *Tropical regions, Grassland, Fertilizing, Aerial spraying, Tractors, Slopes, Proteins, Growth, Beef cattle, Dairy cattle, Developing country application, Calves.

There is a great potential for forage and cattle production in the humid tropics with year round growing weather, usually abundant rainfall, and generally deep, porous soils. There are vast areas of rolling to steep lands in this region that require the protection against erosion that grasslands can afford. Cattle production on these lands can be efficient since grasslands can be fertilized aerially, or with tractors modified to work on rather steep slopes while cattle harvest the forage by grazing. The research discussed in this bulletin was carried out over the last 30 years under conditions typical of vast areas in the humid tropics. Well managed pastures maintained 5 head/ha of cattle weighing an average of 270 kg each throughout the year, with annual gains in weight exceeding 1,000 kg, or 2.5 milk cows producing over 7,500 liters of milk with no concentrate feed.

PB84-180314/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Review of Literature Relevant to Food Consumption Activity,
A. I. Abdou. May 82, 25p UCD/ADS/EWP-041
Contract AID-263-0041
Prepared in cooperation with Zagazig Univ. (Egypt).

Keywords: *Food supply, *Egypt, Food habits, Income, Demand(Economics), Diets, Proteins, Nutrition, Developing countries, Developing country application.

Literature relevant to the food consumption activity of the ADS Economics Subproject was reviewed. Abstracts given were categorized by the following topics: Food shortage problem; Income, food expenditure, the demand for food; Nutritional outcomes; Food consumption; The Egyptian diet; The protein problem; and Selected nutrition studies.

PB84-180322/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Economics of Tractors in Egyptian Agriculture,
M. Khalil. Oct 81, 35p UCD/ADS/EWP-039
Contract AID-263-0041
Prepared in cooperation with Zagazig Univ. (Egypt).

Keywords: *Agricultural machinery, *Agricultural economics, *Egypt, Demand(Economics), Cost effectiveness, Economic factors, Supply(Economics), Animals, Loads(Forces), Developing country application.

Tractors play a principal role in agriculture since farming operations can be carried out with greater efficiency and at lower cost then with human-or or animal-power. The paper deals with the economics of tractorization of Egyptian agriculture, including the potential benefits, the demand for and supply of tractors in Egypt, the present situation, and suggestions for the future.

PB84-180363/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Agricultural Trade Policy in Contemporary Egypt,
H. A. Khedr, and T. E. Petzel. Sep 82, 13p UCD/ADS/EWP-091
Contract AID-263-0041
Prepared in cooperation with Ministry of Agriculture, Cairo (Egypt) and Stanford Univ., CA.Portions of this document are not fully legible.

Keywords: *International trade, *Agricultural economics, *Egypt, Government policies, Exports, Economic factors, Volume, Rice, Cotton, Area, Farms, Constraints, Horticulture, Tomatoes, Developing country application.

The paper discussed both traditional (i.e., cotton and rice) and new (i.e., horticultural) crop exports of Egypt. Three main themes were addressed for each group--comparative advantage, international market composition, and the structure and policy of Egyptian agricultural exports. The major policy points addressed dealt with the composition and size of agricultural exports. The future of new exports, such as fresh tomatoes, looks bright but the difficulties must not be understated. So between the traditional and the new, agricultural exports can play a stronger role in Egypt's economy. The dominant policy should apparently be to loosen the constraints holding back the potential of the agricultural sector. 'The stage would be set for a healthy, steady growth in the horticultural area.'

PB84-180405/GAA PC **A06**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Experience of Some Countries in Agricultural Mechanization.
Economics working paper series,
M. Khalil. May 81, 112p UCD/ADS/EWP-015
Contract AID-263-0041

Keywords: *Agricultural machinery, *Agricultural economics, *Egypt, History, Economic factors, Political objectives, Social effect, Developing country application.

Agricultural development in each country is determined by specific natural, historical, political, economic, and social conditions making it impossible to simply transfer successful experiences with mechanization from one country to another. Still, the learning experiences that other developing countries have had with the mechanization of agriculture may serve as valuable examples to Egypt. The technological status of agriculture in equatorial African countries, Asia, Latin American countries, Romania, and India was reviewed. The possibilities of applying these experiences to the modernization of Egypt's agriculture were discussed.

PB84-180421/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Livestock and Crop Production Linkages: Implications for Agricultural Policy.
Economics working paper series,
J. B. Fitch, and I. Soliman. Sep 82, 26p UCD/ADS/EWP-092
Contract AID-263-0041
Prepared in cooperation with Agrimanagement (Egypt) and Zagazig Univ. (Egypt).

Keywords: *Crops, *Livestock, *Agricultural economics, *Egypt, Production, Government policies, Economic factors, Performance evaluation, Meat, Dairy products, Farm management, Surveys, Developing country application.

Studies have clearly indicated the high degree of interdependence between crop and livestock production on traditional Egyptian farms. For policy makers to ignore these essential links would be folly. Given the existing agricultural price policies, it is not surprising to find farmers increasing the area in berseem to feed to produce meat and dairy products (prices uncontrolled) and reducing the area devoted to cotton and wheat (prices controlled). But there are other reasons besides price policy for increased livestock production. Using 1977 Farm Management Survey data from ten villages, the paper analyzed some of these other non-price links, in particular, land tenure and farm size.

PB84-180660/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Appropriate Technology for Agricultural Intensification.
Economics working paper series,
F. C. Child. May 81, 11p UCD/ADS/EWP-006
Contract AID-263-0041

Keywords: *Agricultural economics, *Egypt, Magnitude, Output, Economic factors, Capital, Steel plants, Automation, Developing country application, Developed countries.

In discussing agricultural intensification--extracting the maximum output from limited resources--the paper is clear that the critical factor for growth in Egypt is capital, not land or labor. The dangerous temptation, however, is to shortcut the growth process and adopt ready-made, capital-intensive technology from developed countries. This approach is not the appropriate one for a capital-scarce, labor-abundant economy. Plans for capital-intensive steel mills, nuclear energy plants, fully automated poultry plants, and the like should surely be reexamined and possibly abandoned. Rather, development policy in Egypt should change its direction dramatically, moving instead toward a labor-intensive technology.

PB84-180678/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Importance and Repercussions of Cultivating the American Short Staple, Short Duration Cotton on the Egyptian Economy,
M. Torayeh. Jul 82, 24p UCD/ADS/EWP-081
Contract AID-263-0041
Prepared in cooperation with Zagazig Univ. (Egypt).

Keywords: *Cotton, *Agricultural economics, *Egypt, Yield, Growth, Seasonal variations, Economic factors, Imports, United States, Planting, Comparison, Grains(Food), United States, Cost analysis, Developing country application, Food security.

There are several motives for introducing to Egypt American varieties of cotton which are shorter stapled and have a shorter growing season. First, Egypt has one of the smallest ratios of cultivated land to population in the world; the introduction of American cotton would be land-saving. Second, the issue of food security requires that Egypt's historical specialization in extra-long staple cotton be reconsidered because of vastly increased imports of cereals. Third, Egyptian cotton production is not sufficient even to meet local textile needs, indicating that higher-yielding varieties should be grown. Fourth, cotton is a labor-intensive crop; again, higher-yielding varieties would better cover escalating labor costs. Finally, new varieties might help alleviate Egypt's 'cotton problem'--continuously increasing production costs, fixed farm prices, accumulating stocks, decreased demand, and new entries in the international market.

PB84-180868/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Some Welfare Implications of the Wheat Subsidy and Trade Policy in Egypt,
R. M. El-Sayed, D. Abdou, B. D. Gardner, and R. Green. Aug 82, 28p UCD/ADS/EWP-045
Contract AID-263-0041
Prepared in cooperation with Ministry of Agriculture, Cairo (Egypt), and Zagazig Univ. (Egypt).

Keywords: *Wheat, *Agricultural economics, *Egypt, Prices, Flours(Food), Economic factors, Government policies, Bakery products, Cost analysis, Mathematical models, Efficiency, Developing country application, Institutional framework.

The paper examines the subsidy structure of wheat and wheat flour in Egypt and explores the significant economic implications. The institutional framework associated with the distribution and pricing of wheat, wheat flour and bread is described in some detail. These institutional aspects are then incorporated into an analytical model to evaluate the economic efficiency implications of the government's intervention policies in the wheat market. Estimates are made of the subsidies received by the consumers of wheat products and of the welfare costs to the Egyptian economy of the government's policies.

PB84-180942/GAA PC **E04**/MF **E01**
Osaka Municipal Urban Engineering Information Center (Japan).
Osaka and Its Technology, Volume 5, 1984.
1984, 65p
See also Volume 4, PB84-118678.Color illustrations reproduced in black and white.

Keywords: *Urban planning, Landscaping, Forecasting, Rail transportation, Water pollution control, Fire prevention, Polymers, Girder bridges, Sewage treatment, *Japan.

The Osaka Municipal Urban Engineering Information Center was established in 1982 with the objective to collect, classify and exchange theses and technical information on urban engineering and technology for reference and to extend expert advice and cooperation in the execution of various engineering projects of local governments at home and abroad. This issue contains articles on the following topics: An Evaluating System for Street Landscape and Its Application; A Demand Forecast System for Railway Passengers in the Metropolitan Area; Basic Investigation on Water Pollution Control Problems; On Characteristics of Cross-Sectional Deformation Two Single-Web Main Girder Bridges with Steep Plate Decks; Application of Fire Prevention Engineering for the Disaster Prevention City Plan; and An Outline of Activities in the Field of Polymer Chemistry at the Osaka Municipal Technical Research Institute.

PB84-181072/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Livestock Economy in Egypt: An Appraisal of the Current Situation.
Economics working paper series,
J. Fitch, and I. Soliman. Aug 81, 45p UCD/ADS/EWP-029
Contract AID-263-0041
Prepared in cooperation with Agrimanagement (Egypt).

Keywords: *Livestock, *Agricultural economics, *Egypt, Appraisals, Government policies, Economic factors, Performance evaluation, History, Developing country application.

There has been very little in-depth research on Egypt's important livestock sector; the livestock data base is reputed to be one of the weakest components of Egyptian agricultural statistics. Government policies have tended to be spur-of-the-moment responses to crises, offering little hope of remedying Egypt's livestock problem in the long run. Yet, policy makers if they are to take effective action to improve the sector need to be appraised of the performance of policies of the past.

PB84-181106/GAA PC **A03**/MF **A01**
Center for Energy and Environment Research, San Juan, PR.
Development of Alternative Energy Science and Engineering in the Caribbean.
Final rept.,
J. A. Bonnet, Jr. 22 Dec 83, 48p CEER-S-180
Contract NSF-INT83-02757
See also PB84-145648. Sponsored in part by Department of Energy, Washington, DC.

Keywords: *Research and development, *Energy source development, *Caribbean, *Energy, Substitutes, Research projects, Solar energy, Developing country application, Wind power, Biomass.

This was the third phase of a project to develop the scientific and engineering capabilities of the universities and research institutes of the Caribbean and thereby to assist in the introduction of alternative energy solutions into the region. The project was conceived by the Science and Technology Commission of the Association of Caribbean Universities and Research Institutes. This part of the project consisted of a four day Solar Energy Utilization Workshop for the Caribbean Basin held at the University of Florida in Gainesville. The workshop was carried out by personnel from the Solar Energy and Energy Conversion Laboratory. It included the basics of solar energy conversion and utilization with presentations on specific problems found in the Caribbean Basin. It also included site visits to review solar hardware development and demonstration projects in the Gainesville area. All the major lectures were videotaped. A discussion workshop was held on the last day to develop specific plans to permit the strengthening of institutional capabilities to facilitate the search for solution to the pressing energy problems of the Caribbean. Based on the cumulative experience of this workshop and the two previous ones on wind energy in Dec. 1981 in Barbados and on biomass energy in Puerto Rico in Apr. 1982, a detailed proposal to implement cooperative projects is being prepared to be submitted to international funding institutions. The overall plan proposes, among other things, the compilation of a directory of Caribbean human and institutional capabilities and the creation of a Caribbean research endowment fund. In the education and training areas it provides for technical curriculum review, and energy auditors training program, etc.

PB84-181114/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Modeling Rural Household Behavior,
J. M. Hihn. Jun 81, 32p UCD/ADS/EWP-025
Contract AID-263-0041
Prepared in cooperation with California Agricultural Experiment Station, Berkeley.

Keywords: *Rural areas, *Home Economics, *Socioeconomic status, Behavior, *Egypt, Models, Sociology, Socioeconomic factors, Developing country application.

The purpose of this literature review paper was to provide background for a cooperative modeling effort between (1) economists and (2) sociologists and anthropologists. The Integrated Village Project is an attempt to develop a detailed picture of Egyptian village life by combining the mathematical modeling techniques of the former with the case studies approach of the latter. Accordingly, the paper which reviews general modeling considerations and applied household models is to serve as a communication vehicle to noneconomist collaborators.

PB84-181148/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Laissez-Faire Approach to International Labor Migration: The Case of the Arab Middle East,
A. Richards, and P. L. Martin. Sep 80, 33p UCD/ADS/EWP-004
Contract AID-263-0041
Prepared in cooperation with California Univ., Santa Cruz.

Keywords: *Migration, *Economic analysis, *Egypt, International relations, Developing country applications.

This paper analyzes the effects of labor migration on people and nations involved in the substantial Middle East labor migration. Among the many negative effects on sending countries, e.g., Egypt, are (1) uncertainty, for both economic and political reasons, about the continuation of the current flows of people and remittances; (2) the propensity to consume rather than invest remittances which may result, for example, in an increased demand for imported food; (3) the creation of bottlenecks in the home labor supply as the most able-bodied go abroad; (4) the accentuation of the more negative aspects of migration because of the natural selectivity of the migration process itself. The point is that any general theoretical framework about migration is of little use when applied to the soecific economic and political problems of sending and receiving countries. The answer is not in a laissez-faire policy (i.e., absence of policy) but in very specific policies addressed to problems arising from labor migration.

PB84-181155/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Opportunity Cost of Animal Labor in Egyptian Agriculture,
W. M. Dyer. Jun 80, 31p UCD/ADS/EWP-003
Contract AID-263-0041
Prepared in cooperation with Stanford Univ., CA. Food Research Inst.

Keywords: *Animal energy, *Agricultural economics, *Egypt, Agricultural machinery, Constraints, Economic factors, Benefit cost analysis, Feeding stuffs, Developing country application.

A frequently suggested means of increasing the productivity of the Old Lands is increased agricultural mechanization. Milk animals there presently constitute the major source of agricultural power. Previous estimates of this opportunity loss in feasibility-of-mechanization studies were reviewed and found wanting. Milk production functions for cows and buffalo were estimated. The resulting marginal products for feed and hours worked per season.

PB84-181163/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Cotton Supply Response: A Case of a Distorted Market,
H. A. Khedr, H. Kheir-El-Din, and T. E. Petzel. Sep 82, 20p UCD/ADS/EWP-094
Contract AID-263-0041
Prepared in cooperation with Ministry of Agriculture, Cairo (Egypt), Cairo Univ., Giza (Egypt), and Coffee, Sugar and Cocoa Exchange, Inc., New York.

Keywords: *Industrial development, *Cotton, *Agricultural economics, *Egypt, Supply(Economics), Prices, Economic factors, Marketing, Industries, Mathematical prediction, Farms, Area, International trade, Yield, Developing country application.

Although in as restrictive an environment as is Egypt's cotton industry, it can be argued that supply response to price would be nil, the study argues that there are still several ways that market forces can impact cotton production. Farmers may adjust acreage outside government guidelines and may alter variable inputs to affect yields or the government itself may respond directly to international prices. Three sets of supply response functions (acreage and yield) by staple length were estimated.

PB84-181189/GAA PC **A02**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Egyptian Agricultural Development and the Role of Agricultural Intensification,
M. K. Hindy. Mar 81, 21p UCD/ADS/EWP-005
Contract AID-263-0041
Prepared in cooperation with Ministry of Agriculture, Cairo (Egypt).Portions of this document are not fully legible.

Keywords: *Productivity, *Income, *Agricultural economics, *Egypt. Magnitude, Production, Economic factors, Population growth, Farms, Prices, Land use, Water supply, Manpower, Agricultural machinery, Animals, Loads(Forces), Developing country application, *Double cropping systems.

In an overview of the structure of Egyptian agriculture and the performance of the agricultural sector, the paper discusses the role of agricultural intensification to increase production and income. Major problems are reviewed including the rapidly growing population and the government farm pricing policy which has served to severely misallocate resources and widen the food gap. Attention is now being directed to ways to intensify agricultural production, that is, to achieve more favorable output-input ratios with respect to each of the fundamental resources: Land, water, labor, mechanical power, and animal power. For example, one way to increase the output-land ratio is to double crop.

PB84-181213/GAA PC **A07**/MF **A01**
Agency for International Development, Washington, DC. Office of Agriculture.
'Leucaena leucocephala': A Tree That Defies the Woodcutter.
1 Jun 81, 148p AID-PN-AAJ-944

Keywords: *Fertilizers, Central America, Cattle, Soils, Foods, Farm crops, Livestock, Erosion, Wood, *Leucaena leucocephala, Developing country application.

Leucaena leucocephala, a long-ignored, versatile legume native to Central America, could offer solutions to global ecological problems of denudation, soil erosion, dwindling wood supplies, and crop production. This report documents the potential importance of many Leucaena varieties for wood, forage, fertilizer, and ground cover in tropical and subtropical countries.

PB84-181221/GAA PC **A03**/MF **A01**
Colorado State Univ., Fort Collins. Engineering Research Center.
Development Process for Improving Irrigation Water Management on Farms: Executive Summary,
G. V. Skogerboe, M. K. Lowdermilk, E. W. Sparling, and J. E. Hautaluoma. May 80, 30p WATER MANAGEMENT-TR-65A, AID-PN-AAJ-360
Contract AID/ta-C-1411
See also PB84-181254.

Keywords: *Water management, *Irrigation, *Farming, Agricultural products, Management planning, Developing country application.

Experience has clearly shown that effective on-farm water management can significantly increase agricultural and labor productivity and improve rural income distribution in developing countries. This report, directed toward project managers and summarizing three separate volumes, describes a comprehensive, interdisciplinary process which relies on farmer and client involvement to improve on-farm management of large-scale irrigation projects. The process entails physical and social scientists: (1) working together with farmers to identify the major constraints to agricultural productivity and resource conservation; (2) developing acceptable solutions to priority problems in collaboration with farmers; and (3) implementing a package of solutions utilizing both government and farmer resources. The Project Implementation manual outlines the areas of project authorization--reviewing the solution package, identifying the project approach, preparing objectives, and obtaining project authorization; project organization--selecting personnel, developing institutional linkages, and specifying project management; and project operation--operationalizing objectives, developing a work plan and time schedule, generating farmer participation, and monitoring progress. In conclusion, the authors caution that although the manuals are organized separately and appear distinct, they do overlap and are intended to be used together.

PB84-181239/GAA PC **A06**/MF **A01**
Colorado State Univ., Fort Collins. Engineering Research Center.
Development Process for Improving Irrigation Water Management on Farms: Development of Solutions Manual,
E. W. Sparling, W. D. Kemper, J. E. Hautaluoma, M. K. Lowdermilk, and G. V. Skogerboe. Apr 80, 105p WATER MANAGEMENT-TR-65C, AID-PN-AAJ-361
Contract AID/ta-C-1411
See also PB84-181254, and PB84-181247.

Keywords: *Water quality, *Irrigation, *Farming, *Water management, Economic analysis, Agricultural products, Management planning, Developing country application.

Experience has clearly shown that effective on-farm water management and control can significantly increase agricultural productivity and improve rural income distribution in developing countries. This volume, one of a four-volume series, describes a comprehensive process for improving on-farm irrigation water management in developing countries.

PB84-181247/GAA PC **A06**/MF **A01**
Colorado State Univ., Fort Collins. Engineering Research Center.
Development Process for Improving Irrigation Water Management on Farms: Project Implementation Manual,
J. E. Hautaluoma, D. M. Freeman, W. D. Kemper, J. J. Layton, and M. K. Lowdermilk. May 80, 120p WATER MANAGEMENT-TR-65D, AID-PN-AAJ-362
Contract AID/ta-C-1411
See also PB84-181239.

Keywords: *Farming, *Water quality, *Water management, *Irrigation, Agricultural products, Management planning, Developing country application.

Experience has clearly shown that effective on-farm water management and control can significantly increase agricultural productivity and improve rural income distribution in developing countries. This volume, part of a four-volume series describing a comprehensive system for improving on-farm irrigation water management in developing countries, outlines a process for proposing and obtaining authorization of a project, establishing the project organization, and executing the project to meet its objectives. Operating the project to ensure objectives are met involves establishing a work plan and schedule of events, initiating field operations, establishing field technical support, training farmers, monitoring and evaluating progress, refining the project, and ultimately transferring responsibility for the project to local participants. In addition, long-run project success depends upon adequate farmer participation to ensure that project innovations are integrated into the local agricultural system. A 13-item bibliography (1958-80) is appended.

PB84-181254/GAA PC **A10**/MF **A01**
Colorado State Univ., Fort Collins. Engineering Research Center.
Development Process for Improving Irrigation Water Management on Farms: Problem Identification Manual,
M. K. Lowdermilk, W. T. Franklin, J. J. Layton, G. E. Radosevich, and G. V. Skogerboe. Mar 80, 203p WATER MANAGEMENT-TR-65B, AID-PN-AAJ-363
Contract AID/ta-C-1411
See also PB84-181221, and PB84-181239.

Keywords: *Water quality, *Water management, *Irrigation, *Farming, Agricultural products, Management planning, Developing country application.

Experience has clearly shown that effective on-farm water management and control can significantly increase agricultural productivity and improve rural income distribution in developing countries. This volume, one of a series on a comprehensive process for improving on-farm irrigation water management in developing countries, offers guidelines, concepts, procedures, and methods for identifying factors which inhibit efficient functioning of farm irrigation systems. Problem identification has as its goals: understanding the traditional farming system and its interrelated components; identifying constraints to production, especially on small farms; and providing data which can be used in designing projects for upcoming growing seasons. The authors emphasize the importance of employing an interdisciplinary research team of engineers, sociologists, economists, and agronomists and encouraging active farmer participation. Major problem identification activities can be divided between reconnaissance and diagnosis. A 56-item bibliography (1954-79), data management and budget analysis forms, and a list of equipment needs are appended.

PB84-181312/GAA PC **A04**/MF **A01**
Puerto Rico Univ., Rio Piedras. Agricultural Experiment Station.
Determinacion de la Cantidad de Alimento Concentrado Necesario para la Produccion Economica de Leche (Determination of the Quantity of Concentrated Feed Necessary for the Economic Production of Milk),
M. A. Padilla. Mar 83, 64p PUB-146
Text in Spanish.

Keywords: *Animal feeds, *Agricultural economics, Mathematical models, Production, Milk, Cattle, Feeding(Supplying), *Puerto Rico, Developing country application.

Dairy feed investment is the primary cost factor in the operation of dairy farms in Puerto Rico, so a study was made to find a way to improve its use. The objective was to develop a mathematical formula to optimize the use of concentrate feeds to lower the production costs of milk. To do this the study had to develop a suitable milk production function; to find, through this function, the marginal productivity of the concentrate feed; and to optimize the concentrate use, taking into consideration the value of milk at the farm level and the cost of the concentrate feed. The last was done through five analyses.

PB84-182468/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Constraints in the Innovation Diffusion Process: Lessons for Egypt,
R. I. Rochin. Mar 81, 20p UCD/ADS/EWP-022
Contract AID-263-0041

Keywords: *Agriculture, *Technology transfer, Prices, Attitudes, Risk, *Egypt, Developing country application, Price elasticity.

The paper analyzes the diffusion process of an agricultural innovation. Graphing the cumulative percentage of farmers as more and more adopt the innovation over time, generally results in an S shaped curve*, probably never quite reaching 100 percent. Farmers can be characterized by where they enter this curve in time: Innovators, early adopters, early majority, conservatives, and finally, the laggards or late adopters. Most studies show innovators and early adopters to be literate and better off economically than the more hesitant groups. Attitudes toward risk play an important role in the decision to adopt. Effective communication and extension can help diffuse the innovation especially among farmers who are usually late adopters. In assessing the impact of the innovation, several considerations are important, including the elasticity of substitution among inputs, the net social return to society, the cost of diffusion, and the product price elasticity. For example, too rapid diffusion of a new product with an inelastic demand could be devastating to price and returns to growers.

PB84-182476/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Integration of the International Market for Cotton,
E. Monke, and T. Petzel. Oct 81, 34p UCD/ADS/EWP-043
Contract AID-263-0041
Prepared in cooperation with Arizona Univ., Tucson and Stanford Univ., CA.

Keywords: *Cotton plants, *International trade, Prices, Policies, Egypt, World market, Developing country application.

Although Egypt accounts for only a small portion of the international cotton market, it is a principal supplier of extra long staple (ELS) varieties. The impact of changes in quantity of Egypt's ELS on world prices depends importantly on the degree of market integration, i.e., whether or not ELS is a specialty market, largely independent of other staple length varieties. Another important consideration is that yields are considerably higher for other varieties than for ELS. The paper investigates price relationships among different staple length with particular attention to the distinction between ELS and shorter staple length varieties. Results indicate that the world cotton market should be considered as a single market in the long run, in which Egypt has only a small share. Few end uses remain that uniquely require ELS. The price premiums which ELS used to enjoy have declined markedly. Also, because of higher yields from other varieties, policies which promote ELS production should be reexamined.

PB84-182484/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Targeting Plant Breeding Research for Traditional Farmer Intensification Needs - Triticale Experiences in Mexico,
D. E. Hansen. Mar 81, 28p UCD/ADS/EWP-012
Contract AID-263-0041

Keywords: *Plants(Botany), *Agricultural economics, *Technology transfer, Agricultural products, Yield, Low income groups, Mexico, Farmers, Developing country application.

The concern of the paper is with agricultural intensification--increasing the net real value of output per unit of cultivated area--directed at traditional farmers, i.e., those who farm mostly with methods of previous generations. The successful experience of peasant farmers in Erongaricuaro, Mexico, with growing triticale (a high-yielding rye-wheat cereal) is described as (1) a surprising counter example to the expected acceptance pattern of technology transfer and (2) illustrating the importance of targeting plant breeding effects for small farmer needs. This is one rare case in which low-income, peasant farmers were early adopters of a technological innovation. Part of the reason for success lies in plant breeders and extension workers targeting the needs of traditional farmers which differ from those of commercial agriculturists.

PB84-182658/GAA PC **A03**/MF **A01**
Texas Univ. at El Paso.
Tracing Sex Differentiation in Donor Agricultural Programs,
K. A. Staudt. 1979, 47p AID-PN-AAH-774

Keywords: *Agriculture, *Socioeconomic status, *Women, Manpower utilization, Third World countries, Developing country application.

In the first section of this paper, policy-oriented research on women's agricultural involvement is reviewed. Utilizing a variety of sources, the paper then attempts to trace differential effects of donor organization agricultural policy and intervention strategies, reported in the second section of the paper. These attempts illuminate the difficulties of and prospects for tracing sex-differentiated policy consequences, discussed in section three. Women are often subsumed within the family unit, and are dispersed within a population to a greater extent than racial groups, socio-economic groups, or geographic regions within a nation. The tasks set forth in this paper are expected to contribute generally to literature on policy monitoring and policy impact.

PB84-182708/GAA PC **A10**/MF **A01**
Bell (James) and Associates, Inc., Arlington, VA.
Coverage, Characteristics, Administration, and Costs of Pension and Health Care Benefits in Small Businesses.
Final rept.,
J. Bell, and D. Kennell. Mar 84, 214p*
Contract SBA-6059-OA-82

Keywords: *Small businesses, *Health, Personnel, Government policies, Regulations, Insurance, Cost analysis.

Congress and other agencies of the federal government are currently engaged in policy discussions concerning reforms to ERISA, as well as a variety of proposals that would alter regulation concerning employer deductions for health benefits coverage and stimulate competition among health providers and insurers. A major issue in these debates is the degree to which proposed changes may adversely affect small businesses and inhibit their ability to compete in the markets for their goods and services. Major changes in these regulations, particularly as they relate to small businesses, cannot be effectively evaluated without up-to-date, reliable and valid analysis of current trends in employer benefits. The objective of this project is to assess the costs to small employers of providing employee benefits relative to the costs to large employers, with particular emphasis on the amount and types of pension and health care coverage and benefits.

PB84-184035/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Agricultural Crop Pattern and Egyptian Food Security: Some Preliminary Results,
A. H. Sarris. Nov 81, 29p UCD/ADS/EWP-049
Contract AID-263-0041

Keywords: *Economic analysis, *Agriculture, *Crops, *Food supply, Mathematical model, Egypt, Exports, Food consumption, Developing country application.

Although food and agricultural policy in Egypt is consistent in driving toward 'national food security,' the concept itself is not clear, and goals espoused by different governmental agencies, though in the name of national food security, are inconsistent. Notably absent from discussions of achieving national food security are the effects of the international market on agricultural production strategies. The paper attempts to fill this gap. A model estimating net (potential) foreign earnings of a crop, taking account of the variation in yields and after domestic demand has been met, was used in the analysis. Tables were complied for several field crops, fruits, and vegetables giving levels of foreign earnings below which the crop would find itself once in every five and once in every ten years. Results indicate that in the diversification of Egyptian crop rotation, fruit and vegetable crops should be emphasized. Expansion of wheat acreage may actually reduce food security by taking away land from more profitable crops. Also, there was some evidence that maize area should increase at the expense of cotton, but not of vegetables.

PB84-184472/GAA PC **E03**/MF **E01**
National Research Inst. for Mathematical Sciences, Pretoria (South Africa).
Modelling the Demand for Construction.
Technical rept.,
H. R. Weistroffer. Jul 83, 23p CSIR-TWISK-322

Keywords: *Economic analysis, *Construction, Mathematical models, Developing countries, South Africa, Demand(Economics), Economic factors.

A system dynamics approach to modelling the demand for construction in South Africa is described. The model presented in this paper is intended as a first step in an iterative process of modelling construction demand, and as such is deliberately kept small. Results obtained through the model using historical data indicate that the relations included in the model are indeed relevant. The accuracy of the model is discussed and suggestions for further developing the model are made.

PB84-184761/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Summary and Proceedings, ADS (Agricultural Development Systems) Economics Policy Workshop (9th), Food Price Policy and Subsidies.
May 83, 14p UCD/ADS/EWP-152
Contract AID-263-0041

Keywords: *Food, *Economic analysis, Policies, Food consumption, Distribution systems, Patterns.

This report summarizes the issues surrounding food price policies and food subsidies in Egypt. Papers and discussion focused on the impact of food pricing and distribution policies, the role of the food subsidy system, the impact of agricultural pricing on production patterns, and on food consumption and distribution patterns. The proceedings paper reports the consensus arrived at by workshop participants and gives major recommendations for improving the food pricing and distribution policy so equity goals can be achieved at lower efficiency costs and welfare losses: (1) Identify appropriate target groups for the food subsidy and distribution programs. (2) Subsidize at the final-product level rather than rationing or a multi-price system.

PB84-184779/GAA PC **A02**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Summary and Proceedings, ADS (Agricultural Development Systems) Economics Policy Workshop (8th), Livestock Economics in Egyptian Agriculture.
Mar 83, 23p UCD/ADS/EWP-125
Contract AID-263-0041
See also PB84-166941.

Keywords: *Agricultural economics, *Livestock, *Marketing, *Egypt, Meetings, Policies, Breeding, Veterinary medicine, Feeding stuffs, Milk, Developing country application.

This report contains policy recommendations growing out of workshop discussions which include: (1) Egypt's strategy for livestock production should recognize the dominant role of the small traditional farmer. The aim should be to improve his productivity by providing artificial insemination, medicines, and other veterinary services and improving feed availability. (2) More emphasis should be placed on milk production, including improvements at the production, processing, and marketing levels. (3) The government needs to rethink and reorganize its system for processing and allocating feed concentrates. The current system of subsidies discourages the development of new domestic feed sources and tends to favor less efficient producers.

PB84-186444/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Mechanization, Migration, and Labor in an Egyptian Village,
N. S. Hopkins. Dec 81, 28p UCD/ADS/EWP-47
Contract AID-263-0041
Prepared in cooperation with American Univ., Cairo (Egypt).

Keywords: *Farming, *Migration, *Employment, Farm management, *Egypt, Developing country application.

The paper is a preliminary report of anthropological field work in the village of Musha, Egypt. It contributes to the debate about the implications and consequences of the spread of agricultural mechanization in Egypt. Part of the confusion about the issue--whether mechanization leads to migration because of labor displacement or whether mechanization is necessary because of migration-induced labor shortages--arises because of neglecting to study the basic way labor is organized. Since the basic unit for organizing labor in Egypt is the household, the focus of the paper is on its role. Labor decisions depend on whether a particular household has more labor than land, more land than labor, or is about evenly balanced between them. Thus, careful study at the household level should reveal much about the labor-mechanization-migration relationships.

PB84-187152/GAA PC **A05**/MF **A01**
International Statistical Inst., Voorburg (Netherlands).
Comparative Studies: Cross National Summaries. Number 9: Contraceptive Practice,
E. Carrasco. Jun 81, 82p AID-PN-AAK-010
Prepared in cooperation with World Fertility Survey, London (England).

Keywords: *Contraceptives, *Birth control, *Women, Foreign countries, Demography, Developing countries, Developing country application.

As part of a series of comparative international studies, this report describes similarities and differences in levels and patterns of contraceptive use in 19 countries. To make these comparisons, only contraceptive use, demographic, and control variables are used. Both ever-use (use at any time) and current use of contraceptives are assessed and a distinction is made between efficient (i.e., sterilization, IUD) and inefficient (i.e., rhythm, withdrawal) contraceptive methods. The demographic variables include the age of respondents and the number of living children, while control variables refer to four control groups of women: ever-married (includes 'ever in union'); currently married; fecund (currently married women who are physiologically capable of having children, or who are pregnant, or who have been sterilized for contraceptive purposes); and exposed (all fecund women except those who are pregnant). Information for the tables and graphs was collected through questionnaires designed to ascertain knowledge and ever-use of contraceptive methods in Bangladesh, Fiji, Indonesia, Jordan, Republic of Korea, Malaysia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, Colombia, Costa Rica, Dominican Republic, Guyana, Jamaica, Mexico, Panama, and Peru.

PB84-187178/GAA PC **A03**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Productivity of Small Ruminants in West Javanese Farming Systems,
H. C. Knipscheer, and T. D. Soedjana. Jan 83, 41p TRS-13
Grant AID/DSAN/XII-G-0049

Keywords: *Ruminants, *Animal husbandry, *Indonesia, Economic factors, Surveys, Production, Mortality, Breeding, Economic impact, Reproduction(Biology), Management, *Land use, Income, Developing country application, Small farms.

The report contains the results of a survey intended to provide previously lacking data about productivity of sheep and goats under smallholder conditions in West Java. A rapid-assessment, one-visit survey was carried out at three locations, in which farmers were asked to report the monthly changes in the size and composition of their flocks during October, 1980, to October, 1981. The purpose was to provide information to guide the formulation of biological research programs. Areas identified as needing further research included: the causes of high mortality rates among grazing sheep in lowland areas; the impact of farmers' breeding management on lambing rates; and the long-term impact of animal-distribution schemes on smallholder herds/flocks, particularly where grazing areas are available.

PB84-187194/GAA PC **A03**/MF **A01**
International Statistical Inst., Voorburg (Netherlands).
Comparative Studies. Cross National Summaries: Breastfeeding,
B. Ferry. May 81, 43p R-13, AID-PN-AAK-011
Prepared in cooperation with World Fertility Survey, London (England).

Keywords: *Breastfeeding, *Asia, *Latin America, Comparison, Demographic surveys, Birth, Statistical data, Developing country application.

Patterns for the two continents contrast markedly for both the last closed birth interval and the open interval. The median duration of breastfeeding is generally 1-2 years in Asia and 6 months in Latin America (except for Peru). Surprisingly, breastfeeding duration did not differ according to the child's sex even in countries where male children are preferred. The survey partially solves the complex problem of linking breastfeeding with mortality by restricting some analyses to surviving children. Much more work is needed in this area, however. The data's doubtful reliability, e.g., as evident in the different biases obtained for the open and closed intervals, makes it difficult to analyze breastfeeding trends in detail, as does restricting analysis to demographic variables.

PB84-187434/GAA PC **A03**/MF **A01**
Colorado State Univ., Fort Collins. Dept. of Economics.
Developing Farm Enterprise Budgets: An Experiment in the Dominican Republic,
T. M. Dickey, and R. L. Tinnermeier. Sep 81, 48p OP-6, AID-PN-AAK-032
Contract AID/ta-CA-3

Keywords: *Farming, *Crops, *Financial management, Management, Farm crops, Prices, Production, Interviews, Dominican Republic, Developing country application.

The general inadequacy of existing farm enterprise budgets within the Dominican Republic's (DR's) agricultural sector led to the design of a new, standardized, interinstitutional budget system for use by the Agricultural Development Bank and the Secretariat of Agriculture's Farm Management Division. This study describes this new budgeting methodology and provides guidelines for its replication in other countries.

PB84-187442/GAA PC **A05**/MF **A01**
Colorado State Univ., Fort Collins. Dept. of Economics.
Analysis of Three Methodologies for Collecting Data from Small Farmers in the Dominican Republic,
J. D. Longwell. Jan 81, 95p AID-PN-AAK-033
Contract AID/ta-CA-3

Keywords: *Farming, *Financial management, *Dominican Republic, Developing countries, Production, Comparison, Surveys, Cost estimates, Developing country application.

In preparing investment plans for small farmers, credit agents for the Dominican Republic's Agricultural Bank often estimate small farmer production costs using secondary sources such as informal surveys of area input suppliers. To determine the objectivity of Bank estimates, an alternative method of data collection, based on interviews with small farmers themselves, was tested in the Cibao Valley and the results compared with estimates prepared by Bank agents. Two samples were interviewed: (1) a representative (purposive) sample of five farmers chosen by Bank agents was interviewed about land market value, labor, input prices, and level of technology; and (2) a random sample of 30 farmers was similarly interviewed. A comparison of the data collected indicates that credit agents' estimations vary significantly from the production cost data provided by farmers in the interviews. Little difference in data was noted between the two samples. Consequently, by estimating production costs instead of systematically measuring them (through questionaires), the Bank is not accurately representing actual production costs faced by its farmer clients. The consequences of under-and over-estimating production costs (no consistent pattern was noted) in the farm investment plan can affect, respectively, a farmer's ability to repay loans and the Bank's marginal productivity. This translates into nonviable and ineffective agricultural credit policies.

PB84-187558/GAA PC **E15**/MF **E01**
National Building Research Inst., Pretoria (South Africa).
Housing Challenge: A Positive Approach. Proceedings of the Building Research Conference Held at Pretoria, South Africa on 24-26 May 1983.
May 83, 446p*
Text in English and Afrikaans.

Keywords: *Housing, *Building materials, *Construction, *South Africa, Developing countries, Sanitation, Low income groups, Construction materials, Urban relocation, Socioeconomic status.

This document contains 29 papers and 46 case studies presented at this conference. Topics include: Rural-urban relations in developing countries; contextual and social issues important in self-help schemes; Managing a supported self-help housing scheme; Road layout-key to cost-effective servicing of residential land; Urban design: its importance in the low income sector; An approach to essential standards for housing; Low cost urban sanitation in Lesotho; Unit design and construction; Innovation to the rescue.

PB84-187590/GAA PC **A03**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Economics Policy Workshop Paper (1st): The Economics of Agricultural Intensification,
B. Glassburner, and M. R. El-Amir. May 81, 43p UCD/ADS/EWP-010
Contract AID-263-0041
Prepared in cooperation with Assuit Univ. (Egypt).

Keywords: *Agriculture, *Marketing, *Food supply, Food consumption, Meetings, Government policies, *Egypt, Incentives, Agricultural economics, Agricultural intensification, Developing country application.

The paper captures the essential results of a 1981 four-day workshop on agricultural intensification attended by more than 100 people who heard 35 papers presented. Significant consensus was reached on several key points: (1) Egypt faces a food gap crisis of serious proportions as demand for food is increasing rapidly but production growth has stagnated. (2) Since Egypt has very little potential to expand either land or water resources, intensification of existing agriculture is necessary to avert the food crisis. (3) Farmers, therefore, must be given proper incentives. (4) Progress must be made toward dismantling the worst of the market distortions imposed an agricultural by the government. (5) Economic success for the nation is impossible without a strong agricultural sector. (6) Agricultural research must also be intensified.

PB84-187624/GAA PC **A04**/MF **A01**
California Univ., Davis. Agricultural Development Systems/Egypt Project.
Economics Policy Workshop (2nd). Papers and Proceedings: Agricultural Marketing in Egypt.
Jun 81, 58p UCD/ADS/EWP-030
Contract AID-263-0041

Keywords: *Agriculture, *Economic analysis, *Marketing, Policies, *Egypt, International trade, Meetings, Developing country application.

The proceedings summarize the major conclusions developed during a workshop on agricultural marketing in Egypt held in June 1981. First, significant marketing problems were identified. It was found that agricultural marketing research has received insufficient attention, there is a lack of understanding of production-marketing linkages, coordination of research between economists and industry personnel is needed, and necessary data are lacking, as are meaningful analysis and appropriate applications to the policy-making process. Second, the 'state of the art' in marketing research was reviewed with the findings that most is done by graduate students in pursuit of a degree; there is very little extension of the research beyond academics. Third, appropriate methodological approaches were discussed with an improved data base as a top priority. Finally, potential research projects were identified in the areas of commodity problems, marketing functions, and institutional studies.

PB84-188895/GAA PC **A03**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Genetic Influence on Foraging Behavior (Diet Selection) of Ruminants (Sheep and Goats),
L. Warren, J. M. Shelton, and D. N. Ueckert. Sep 83, 38p TRS-32
Grant AID/DSAN/XII-G-0049
Prepared in cooperation with Texas Agricultural Experiment Station, San Angelo.

Keywords: *Ruminants, *Nutrition, Suitability, Production, Food, Animal behavior, Comparison, Histology, Plants(Botany), Developing country application, Grazing.

The increasing human population will continue to place pressure on the world's resources. The end result will be that the grazing animal will likely be relegated to the use of resources not suitable for the production of food crops. In this connection, it will become increasingly more important to select between and within species for animals which will utilize available forage resources to the best advantage. The present report is concerned with a series of investigations comparing the grazing behavior between species, breeds within species, and sire groups within a given genotype. This work confirmed previous studies showing important species differences. However, these studies also confirmed the existence of breed differences for sheep and goats, and the existence of significant sire differences within breeds of young male goats.

PB84-188903/GAA PC **A02**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Los Residuos de Cosecha como Estrategia para la Alimentacion de Rumiantes Menores (Crop Residues as a Strategy for Small Ruminant Feeding),
W. L. Johnson. 1980, 20p TRS-2
Grant AID/DSAN/XII-G-0049
Text in Spanish. Prepared in cooperation with North Carolina State Univ. at Raleigh.

Keywords: *Crops, *Animal feeds, *Ruminants, Vegetation, Requirements, Feeding(Supplying), Animal nutrition, Fibers, Digestion(Biology), Concentration(Composition), Proteins, Carotene, Diet, Developing country application.

Crop residues and preharvest foliages are being used for small ruminants in intensive and extensive feeding systems. Optimum use of these materials will depend on knowledge of animal requirements, which vary with breed type and production class, and on nutritional evaluation including palatability, total cell-wall fiber, rate of fiber digestibility, and concentrations of protein, minerals, carotene and anti-quality substances. Availability of alternative feeds, combinations of feeds in mixed diets and animal adaptation are other pertinent factors. Variability among specific lots of crop residues means that composition tables are of limited use; therefore, access to a rapid and reliable feed analysis service is of great importance.

PB84-189182/GAA PC **A13**/MF **A01**
California Univ., Davis.
Partners in Research: A Five Year Report of the Small Ruminant Collaborative Research Support Program.
Rept. for 1978-83,
R. D. Blond. 1983, 293p
Grant AID-DSAN-XII-G-0049

Keywords: *Agricultural economics, *Ruminants, Goats, Sheep, Domestic animals, Milk, Meat, Fibers, Production, Indonesia, Peru, Brazil, Morocco, Kenya, Developing country application.

Partners in Research was produced by the Small Ruminant Collaborative Research Support Program (SR-CRSP) to document the accomplishments of the program for the initial five year grant period. The long range goal of the program is to improve the efficiency of milk, meat, and fiber by sheep and goats in order to increase the food supply and income of the smallholder in lesser developed countries (LDCs). The program hopes to expand the body of knowledge and increase the level of competence of US and LDC scientists to conduct research on small ruminants in smallholder production systems. The research, coordinated by fourteen scientists (PIs) from 10 US institutions, is being undertaken in five countries (Indonesia, Peru, Brazil, Morocco, and Kenya).

PB84-189737/GAA PC **A02**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Efficiency of Digestion in Goats and Sheep,
W. L. Johnson. 1981, 20p TRS-8
Grant AID/DSAN/XII-G-0049
Prepared in cooperation with North Carolina State Univ. at Raleigh.

Keywords: *Animal feeds, *Ruminants, Efficiency, *Proteins, Utilization, Diets, Concentration(Composition), Cellulose, Carbohydrates, Cell wall, Digestive system, Comparison, Cattle, Quality, Animal nutrition, Fibers, Rates(Per time), Food consumption, Developing country application, Caseolous lymphadenitis.

The process of converting plant fiber to animal product is complex. Simplistic measures of efficiency such as average product per unit of feed input can be misleading if they do not reflect the critical biological and economics points in this process. Efficiency of protein utilization in the ruminant is influenced by dietary concentrations of non-protein nitrogen, true protein, and bound (unavailable) nitrogenous substances. Energy is derived from rapidly soluable carbohydrates and slowly degradable cell-wall cellulose and hemicelluloses. Intake of energy is influenced by the presence of non-degradable cell-wall matter and its rate of passage through the digestive tract. There is evidence that the goat, compared with sheep and cattle, has become adapted to a low-quality feed resource through his ability to selectively consume the more nutritious (less fibrous) plant parts, and to pass his digesta through at a faster rate.

PB84-189745/GAA PC **A06**/MF **A01**
BJK Associates, Inc., Omaha, NE.
Productivity and Profitability Among Small Family Business: Development and Analysis of a Unique Data Base.
Final rept.,
B. Kirchoff, and J. Kirchoff. Feb 84, 116p*
Contract SBA-7132-OER-83

Keywords: *Productivity, *Small businesses.

Results of this study show that, at least in two SIC code industries studied, firms with nine or less employees differed in important ways from those with more than nine employees. Most importantly, smaller firms appear to be more profitable and exhibit greater efficiency and productivity. Smaller firms are found to be more profitable than the larger firms. The results may indeed point to an underlying economic reality of small businesses. That is, size of business does affect profitability. Smaller businesses, those with nine or less employees, are more profitable than those with 10 to 45 employees; and those businesses with less than 49 employees are more profitable than those with more than 49. But, why is this the case. Many observers of small business perceive the typical model to be the 'mom and pop store,' i.e., a family run business that functions solely to produce an adequate income to support the family. The evidence provided herein contradicts this; instead, it suggests that these businesses are economically viable and more profitable than larger businesses.

PB84-190081/GAA PC **A02**/MF **A01**
Maryland Univ., College Park. Water Resources Research Center.
Disposal of Secondarily Treated Municipal Sewage by Subsurface Irrigation,
L. E. Stewart, D. S. Ross, H. L. Brodie, and T. Sohrabi. Aug 83, 24p OWRT-A-055-MD(1)
Contract DI-14-34-0001-2122
Prepared in cooperation with Maryland Univ., College Park. Dept. of Agricultural Engineering.

Keywords: *Sewage disposal, *Land use, *Sewage treatment, Plants(Botany), Evaporation, Ground water recharge, Urban areas, Turf grasses, Forage crops, Depth, Tertiary treatment.

Trickle irrigation tubing was used for low pressure, uniform subsurface distribution of chlorinated sewage effluent for land treatment and disposal. The effluent was domestic, secondarily treated water from a septic tank and sand filter system. The land provided tertiary treatment of the water through growing plants, evaporation, and groundwater recharge. This method eliminated a point source discharge into a stream and appears to have future application. This experimental system performed well in the fall of 1982 and, with modification, in 1983. Although the rowcrop trickle irrigation tubing (tape) appeared to function satisfactorily in a heavy soil containing stones, rigid wall trickle tubing may be advantageous in problem soils or at deeper depths.

PB84-190230/GAA PC **A02**/MF **A01**
North Carolina Water Resources Research Inst., Raleigh.
Policies and Procedures for Land Treatment of Wastewater,
W. L. Fleming, D. H. Howells, and F. J. Humenik. Aug 83, 20p LAND TREATMENT SER-1, OWRT-B-123-NC(11)
Contract DI-14-34-0001-9144
Prepared in cooperation with North Carolina Dept. of Natural Resources and Community Development, Raleigh, and North Carolina State Univ. at Releigh. Dept. of Biological and Agricultural Engineering. See also PB84-190354.

Keywords: *Land use, *Sewage disposal, *Sewage treatment, Irrigation, Statutes, Public opinion, Acceptability, Regulations, Licenses, Technical assistance, Soil conservation.

The first of a series of five reports dealing with the land (and wetland) treatment of wastewater and sludge prepared under the general guidance of a task force representing the North Carolina Agricultural Research and Extension Services, Water Resources Research Institute, Division of Environmental Management, and Division of Health Services. Draft reports were presented at a regional workshop for critique and input from other sources. Policies and Procedures for Land Treatment of Wastewater introduces the series and discusses public acceptance, North Carolina Statutes and Regulations, Administrative Permitting Procedures and Requirements, and the availability of Advisory and Technical Assistance. The series as a whole provides general guidelines for the design and management of land treatment systems.

PB84-190354/GAA PC **A04**/MF **A01**
North Carolina Water Resources Research Inst., Raleigh.
General Guidelines for Land Treatment of Wastewater,
P. W. Westerman, and L. D. King. Aug 83, 55p LAND TREATMENT SER-2, OWRT-B-123-NC(12)
Contract DI-14-34-0001-9144

See also PB84-190362. Prepared in cooperation with North Carolina State Univ. at Releigh, and North Carolina Dept. of Natural Resources and Community Development, Raleigh.

Keywords: *Sewage disposal, *Sewage treatment, *Marshes, *Land use, Manuals, Design, Monitoring, Public health, Protection, Systems, Economic factors, North Carolina, Sewage irrigation.

The second of a series of five reports dealing with the land (and wetland) treatment of wastewater and sludge prepared under the general guidance of a task force representing North Carolina regulatory agencies and universities. Draft reports were critiqued by other specialists and practitioners at regional conference before publication. This booklet presents a discussion of land treatment of wastewater effluent and general guidelines for design and management of related land treatment systems. It does not present detailed standards and attempts to leave maximum latitude for innovative design by competent professionals. Introduction includes basic considerations for design, general design principles, and system alternatives.

PB84-190370/GAA PC **A03**/MF **A01**
North Carolina Water Resources Research Inst., Raleigh.
General Guidelines for Subsurface Treatment of Wastewater,
C. G. Cogger, and A. R. Rubin. Aug 83, 31p LAND TREATMENT SER-4, OWRT-B-123-NC(14)
Contract DI-14-34-0001-9144
See also PB84-190388. Prepared in cooperation with North Carolina State Univ. at Raleigh.

Keywords: *Sewage treatment, *Sewage disposal, *Land use, Sites, Area, Land use, Requirements, Maintenance, Inorganic nitrates, Standards, Subsurface investigations, Grasses, Adsorption, Maintenance, North Carolina, Organic loading.

The fourth of a series of five reports dealing with land (and wetland) treatment of wastewater and sludge under the general guidance of a task force representing North Carolina regulatory agencies and universities. The report provides general guidelines for the design and management of large subsurface wastewater treatment and disposal systems. While developed primarily for flows greater than 3000 gal. per day, many of the concepts apply to smaller systems. Emphasis is on the land treatment part of the system rather than initial treatment units. Major sections include Waste Characterization, Site Selection, Initial Treatment, Land Area Requirements, Absorption Area Design, and Maintenance and Monitoring.

PB84-190578/GAA PC **A02**/MF **A01**
Municipal Environmental Research Lab., Cincinnati, OH.
Searching for Rapid Methods in Environmental Bacteriology,
E. E. Geldreich, and D. J. Reasoner. May 84, 23p EPA-600/D-84-121

Keywords: *Sanitation, *Waste water, Research, Water quality, Microorganisms, Labeled substances, Immune serums, Fluorescence, Laboratories, Waste water, Sewage, Tests, Requirements, Genetic probes.

The search for rapid methods in sanitary bacteriology is more urgent today than ever before because of increased necessity for processing poorer quality source waters and controlling quality of sewage effluent discharges. Selection of criteria for rapid tests involving either modified conventional procedures or those that require special reagents and instrumentation must consider quantitative or qualitative results within a few hours, data of acceptable sensitivity, selectivity, and precision, and procedures that are amenable to average laboratory operations. The increased cost per test compared to conventional monitoring may be justified in terms or protection afforded to public health. The most promising candidate methods include: use of metabolic inducer compounds, radioisotope labeled substrates, specifically labeled fluorescent antisera and organism specific genetic probes.

PB84-190701/GAA PC **A02**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Small Ruminant Production on Small Farms in West Java, Indonesia: Preliminary Results of a Baseline Survey of Upland and Lowland Farming Systems,
M. Sabrani, A. Muljadi, and A. J. De Boer. Jan 83, 22p TRS-9
Grant AID/DSAN/XII-G-0049
Prepared in cooperation with Winrock International, Morrilton, AR. and Research Inst. for Animal Production, Bogor (Indonesia).

Keywords: *Ruminants, *Indonesia, *Agricultural economics, Economic factors, Surveys, Farms, Elevation, Production, Socioeconomic status, Developing country application, Baseline studies.

This paper characterizes selected small ruminant (sheep and goat) production systems and their economic role on small farms in West Java. It is a preliminary report of a baseline survey that was made of an upland and a lowland ecozone, both of which are representative of large areas in West Java. An objective of this survey, for which data were collected in 1981, was to provide the basic socioeconomic information necessary to understand farmers' conditions and operating constraints.

PB84-190800/GAA PC **A08**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Goat Production within the Farming System of Smallholders of Northern Bahia, Brazil,
G. Primov. Feb 84, 164p TRS-35
Grant AID/DSAN/XII-G-0049
Prepared in cooperation with Missouri Univ.-Columbia. Dept. of Rural Sociology.

Keywords: *Ruminants, *Brazil, Interviews, Farms, Droughts, Survival, *Animal diseases, Cost effectiveness, Demand(Economics), Food, Developing country application, Bahia(Brazil), Caseous lymphadenitis.

Fifty producers in the state of Bahia were interviewed about their total farm production system as well as the calculus which guides their production of goats. Goats are produced under an extensive system in which the animals browse in unfenced land and remain unsupervised at most times. Producers felt that goats were the livestock for the region because they survive best during droughts and are easiest to manage. Diseases, especially caseous lymphadenitis, are seen as the major constraint on production.

PB84-191055/GAA PC **E11**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Formulation of Pesticides in Developing Countries.
1983, 246p UNIDO-ID/297

Keywords: *Pesticides, *Industrial development, Manufacturing, *Environmental surveys, Pollution control, Chemical industry, Labels, Regulations, Safety, Storage, Solid waste disposal, Industrial hygiene, Standards, Plant location, Marketing, Public health, Quality control, Developing country application.

UNIDO pub on the formulation of pesticides in developing countries - covers (1) the role of pesticides in DCs (2) principles of formulation; technical and environmental aspects in location of industry and factory establishment; pollution control (3) key criteria for deciding to set up a local plant (4) marketing and distribution (5) establishing a pesticide laboratory; pesticide formulation analysis; product quality control (6) international standards for industrial safety; occupational hygiene and health aspects; safety in storage, transport and waste disposal; containers (7) labelling and packaging; product safety; regulations procedures. Diagrams, flow charts.

PB84-191279/GAA PC **A02**/MF **A01**
Agricultural Research Service, Peoria, IL. North Central Region.
Animal Breeding Programs: A Systematic Approach to Their Design,
D. L. Harris, T. S. Stewart, and C. Arboleda. 1984, 18p AAT/NC-8

Keywords: *Animal husbandry, Genetics, *Livestock, Evaluation, Reproduction(Biology), Selection, Production, Economic factors, Processing, Systems analysis.

This publication presents a systematic nine-step approach to designing comprehensive animal-breeding programs. These nine steps are (1) describing the production system(s), (2) formulating the objective to the system, (3) choosing breeding system and breeds, (4) estimating selection parameters and economic weights, (5) designing an animal evaluation system, (6) developing selection criteria, (7) designing matings for selected animals, (8) designing a system for expansion, and (9) comparing alternative combined programs. Formulating the objective may be in both simplified and comprehensive forms. This nine-step approach is also a basis for developing computer models for analyzing alternative breeding and selection systems. Principles and procedures including iterative and branched approaches, and the difficulties in designing and implementing coordinated breeding strategies in segmented industries are also reviewed.

PB84-191352/GAA PC **E04**/MF **E04**
Commission of the European Communities, Luxembourg.
Application of the Anaerobic Filter to Biogas Production from Agricultural Waste.
Final rept.,
E. Colleran. c1983, 61p EUR-7563-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Keywords: *Agricultural wastes, *Manures, *Fuels, Methane, Digestion, Microorganisms, Bacteria, Biochemistry, Metabolism, Dairy, Biochemical oxygen demand, *Biogas.

This project was concerned with the anaerobic digestion of liquid and solid agricultural residues. The digester design chosen was the anaerobic filter which differs from the conventional design in having an inert holding matrix which retains the active biological flora. Flow is upward through the matrix and separation of the gaseous products from the liquid effluent occurs at the top of the filter column. Laboratory-scale filters were constructed and filled with a limestone matrix. In all laboratory filters examined, the bulk of the digestion process appeared to be completed within the lower 10cm of the digester, indicating that the remaining 90cm may be largely superfluous.

PB84-191360/GAA PC **E07**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Informatics for Industrial Development,
R. J. Nolan. 26 Nov 83, 136p UNIDO/IS.415, V-83-64337

Keywords: *Information systems, *Computers, *Electronics, *Productivity, *Employment, Microelectronics, Decision making, *Industrial development, Microprocessors, Social factors, Developing country application.

In this monograph an examination is made of the opportunities and threats, constraints and the necessary national infrastructure relating to the informatization of industry in developing countries. In the course of this examination a number of complex issues are confronted. For the Third World, industrial development is a priority. Studies are revealing that informatics will profoundly affect the productive infrastructure and the international division of labour. Policy options for industrialization are narrowed. A re-conceptualization of development strategies is called for and developing countries must not merely reproduce what the industrialized North has done but base their actions on an assessment of long-term comparative advantages. The potential economic effects on productivity and employment are examined. Informatics development in the Third World as a major concept on which action can be based to promote self-reliance is proposed. A conceptual framework for national informatics development is presented.

PB84-191386/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Manufacture of Vaccines in Developing Countries: Background Paper.
2 Nov 83, 16p UNIDO-ID/WG.393/13-REV-1, V-83-63529

Keywords: *Health, *Vaccines, *Technology transfer, *Drugs, Diseases, Industrial development, Developing country application.

This paper on the manufacture of vaccines in developing countries, with special reference to technology transfer covers (1) prevailing disease patterns in the world; world production of vaccines; transfer of technology for manufacture of classical vaccines (2) development and production of improved vaccines; transfer of technology for manufacture of improved and recently developed vaccines.

PB84-191394/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Manufacture of Vaccines in Developing Countries: Issue Paper.
2 Nov 83, 11p UNIDO-ID/WG.393/12-REV-1, V-83-63524

Keywords: *Health, *Vaccines, *Technology transfer, *Drugs, Immunization, Diseases, Industrial development, Developing country application.

This paper on the manufacture of vaccines in developing countries - outlines two documents relating to production of vaccines and other immunizing agents, with reference also to related technology transfer (2) presents issues for discussion (3) annexes (a) classification of biologicals (b) list of the most important vaccines.

PB84-191402/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Study on Downstream Processing Activities in Vegetable Oils in Developing Countries: Promotional Measures,
K. F. Gander. 9 Jan 84, 42p* UNIDO/PC.90, V-84-80288

Keywords: *Vegetable oils, *Marketing, Policies, Feeding stuffs, Government policies, Cooperation, Fuels, Nutrition, Diesel engines, Food processing, Fatty acids, Aliphatic acid esters, Third World countries, Oleochemicals, Developing country application.

This report on promotion of downstream processing of vegetable oils in developing countries covers (1) explanatory notes (2) agriculture; storage, transport and processing; edible oils; fat in animal feed; meal and cake as raw materials; soaps, technical uses, oleochemicals and their derivatives (3) choice of technology (4) present downstream processing activities in moderate, semi-tropical and tropical zones (5) possible measures and industrial policies at the national level, international cooperation, role of UNIDO.

PB84-191428/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
How to Establish a Pharmaceutical Industry in Developing Countries,
18 Jan 84, 41p UNIDO/IO.569, V-84-80586

Keywords: *Drugs, *Industrial development, Government policies, Pharmaceuticals, Developing country applications.

This report on factory establishment in the pharmaceutical industry in developing countries - covers (1) aspects considered in pharmaceutical policies for DCs (2) feasibility study (3) how to start an engineering operation (4) strategy for establishment of production operations and (5) good manufacturing practices.

PB84-191451/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Biomedical Applications of Carbon Fibres,
G. W. Hastings. 2 Feb 84, 14p UNIDO-ID/WG.416/6, V-84-81159

Keywords: *Carbon fibers, *Prosthetics, Plastics, Composite materials, Developing country application, Biocompatible materials.

The report covers (1) use of carbon fiber reinforced carbon (CFRC), generally for orthopedic application (joint replacement) (2) properties of carbon fiber; biocompatibility and mechanical factors (3) carbon fiber reinforced composites; CFRC (4) carbon fiber reinforced plastics: polyethylene, epoxies, acrylics.

PB84-191469/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Genetic Engineering in Veterinary Medicine,
V. G. Moe. 5 Jan 84, 8p UNIDO-ID/WD.412/3, V-84-80181

Keywords: *Livestock, *Veterinary medicine, *Vaccines, Developing country application.

It is clear that the last 10 years have provided some very important scientific developments that are likely to play a significant part in livestock production. The developments in genetic engineering provide considerable hope and cautious optimism in the field of vaccine production against several major diseases of livestock. Its application is of particular interest to the tropical world in the production of vaccines against anaplasmosis, babesiosis, trypanosomiasis, leishmaniasis etc. all very important livestock diseases.

PB84-191485/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Component and Auxiliaries Manufacture for the Shoe and Other Leather Products Industry in the Developing Countries,
F. Schmel. 16 Jan 84, 40p UNIDO-ID/WG.411/3, V-84-80490

Keywords: *Leather, *Footwear, *Industrial development, Plastics, Standardization, Marketing, Productivity, Specialization, Developing country application.

This report on the manufacture of components and auxiliaries for shoes and other leather goods in developing countries covers (1) modernized industry; specialization and cooperation; the role of standardization; product development (2) specifications of components and auxiliary materials: terminology, classification and (3) manufacture of selected components' tools and auxiliaries: basic accessories; leather based and plastics components; metals fittings (4) management, productivity, marketing, production control, standardization, training.

PB84-191550/GAA PC **A03**/MF **A01**
Los Angeles County Sanitation Districts, Whittier, CA.
Health Effects Study, Los Angeles County Sanitation Districts: Summary.
Final rept. Nov 78-Mar 84.
M. H. Nellor, R. B. Baird, and J. R. Smyth. Apr 84, 37p
Grant EPA-R-806399
See also PB84-191568. Sponsored in part by California State Dept. of Water Resources, Sacramento, and Southern California Metropolitan Water District, Los Angeles.

Keywords: *Sanitation, *Waste water, *Health, Groundwater, Replenishment, Viruses, Epidemiology, Water quality, California, Health risks, Los Angeles County(California).

This summary document presents an overview of the Health Effects Study, a multidisciplinary research project which evaluates the health significance of using treated wastewater for indirect potable water reuse by groundwater replenishment. The focus of the study was the Whittier Narrows Groundwater Recharge Project, located in Los Angeles County, California, where disinfected, filtered secondary effluent blended with local storm runoff and imported river water has been used for replenishment since 1962. Included are the findings, conclusions, and recommendations of the study, as well as summaries of the individual research tasks.

PB84-191659/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Water Supply and Sanitation Project Preparation Handbook. Volume 1. Guidelines,
B. Grover. c1983, 189p ISBN-0-8213-0230-2, WORLD BANK TECHNICAL PAPER-12
Prepared in cooperation with United Nations Development Programme, Canadian International Development Agency, and Swiss Directorate of Development Cooperation. Library of Congress catalog card no. 83-14590.
Michrofiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Water supply, *Sanitation, Developing countries, *Project planning, Development, Standardization, Requirements, Rural areas, Urban areas.

These Guidelines provide a practical basis for preparing projects in the water supply and sanitation sector in developing countries. Their main purpose is to make the process of project preparation easier by clarifying and, to the extent possible, standardizing the type of information that should appear in all project preparation reports. Their scope is deliberately broad and covers general concepts, issues and principles which apply to water supply and sanitation projects in both rural and urban areas. (Copyright (c) 1983 The International Bank for Reconstruction and Development / THE WORLD BANK.)

PB84-191808/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Sheep and Goats in Developing Countries: Their Present and Potential Role.
World Bank technical paper.
c1983, 136p ISBN-0-8213-0272-8
Library of Congress catalog card no. 83-23315.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Ruminants, *Animal husbandry, *Agricultural economics, Marketing, Animal ecology, Habitability, Government policies, Socioeconomics, Developing country application.

The objectives of this study are to assess the role of small ruminants (sheep and goats) in the food production systems of developing countries, examine their advantages and disadvantages, analyze the constraints limiting their further contribution to the welfare of small farm/low income rural producers, prescribe measures for overcoming these constraints, and make recommendations related to potential donor involvement in support of the development of sheep and goat production. Small ruminants are viewed as an integral, but not dominant component of complex agricultural systems. Particular emphasis is placed on sheep and goats in mixed herds grazing dry rangelands and in small mixed farm systems in medium to high rainfall areas. An analysis of major constraints -- ecological, biological, policy, and socio-economic -- leads to recommendations on the need for a balanced production system approach for research, training and development programs, and for a combination of support activities such as herd health programs, and formulation of favorable credit, marketing and pricing policies for small ruminants and their products. (Copyright (c) The World Bank, 1983.)

PB84-191857/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Demography and Poverty.
World Bank staff working papers,
M. Lipton. c1983, 144p ISBN-0-8213-0286-8, WP-623
Library of Congress catalog card no. 83-21816.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Economic analysis, *Banking, *Demography, Characteristics, Banking business.

In 1982, a Bank-wide Task Force reported on the impact of Bank activities on poor people. It showed that the proportion of the Bank's lending directed mainly at people in absolute or relative poverty had risen sharply - from about 5% in 1968 to 30% in 1980. Moreover, such activities showed rates of return at least as good as conventional lending, and succeeded, as intended, in benefiting mainly the poor. However, neither borrowers nor lenders have been very effective in benefiting people who lack productive assets - the poorest 20%. It may be, that the power structure somehow prevents the poorest quintile of households in low-income countries - or the poorest decile in middle-income countries - from sharing the fruits of growth, while allowing moderately poor people to do so. This is one of four linked Working Papers that aim to identify such characteristics, if any. (Copyright (c) 1983, The World Bank.)

PB84-191881/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Manpower Issues in Educational Investment: A Consideration of Planning Processes and Techniques.
World Bank staff working papers,
G. Psacharopoulos, K. Hinchliffe, C. Dougherty, and R. Hollister. c1983, 117p ISBN-0-8213-0291-4, WP-624
Library of Congress catalog card no. 83-23334
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW. Washington, DC. 20433.

Keywords: *Education, Developing countries, Policies, Requirements, Forecasting.

This collection of papers discusses a number of issues related to manpower analysis and educational investment in developing countries. Much of the debate in this area over the last two decades has centered on the related merits of the manpower requirements forecasting and rate of return approaches. While the theoretical weaknesses of manpower forecasting have been widely discussed and ex-post evaluations have revealed substantial forecasting errors, this methodology still dominates government manpower planning agencies and development assistance agencies. These papers do not provide a new blueprint for manpower analysis. They take stock of the present situation, advocate the replacement of a dominant technique by a well structured planning process and begin to suggest the wide range of analytic approaches available and necessary if manpower analysis is to be improved within this process. (Copyright (c) 1983, The World Bank.)

PB84-192665/GAA PC **A05**/MF **A01**
Dar es Salaam Univ. (Tanzania). Faculty of Engineering.
Proceedings of the Regional Workshop on Energy for Development in Eastern and Southern Africa Held at Arusha, Tanzania on April 4-13, 1983. Volume 1. Summary Report.
S. R. Nkonoki. 1983, 97p
Sponsored in part by Tanzania National Scientific Research Council, Dar es Salaam, and Swedish International Development Authority, Stockholm.

Keywords: *Energy, *Energy source development, Development, *Solar energy, Developing countries.

The Workshop was conceived as an effort to identify and articulate energy strategies that meet energy needs of a developing country. It focused on patterns of end-use of energy, the opportunities for efficient use of energy, and the possibilities of energy synergisms between and within different sectors such as industry, transport, etc. The Workshop also sought to relate energy end-use analyses to human needs.

PB84-192681/GAA PC **A05**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Alpaca Meat Production and Exchange in Southern Peru,
G. Primov. Jul 83, 88p TRS-31
Grant AID/DSAN/XII-G-0049
Prepared in cooperation with Missouri Univ.-Columbia. Dept. of Rural Sociology.

Keywords: *Ruminants, *Marketing, Supply(Economics), Urban areas, Regions, Developing countries, *Peru, Developing country application, Southern Region(Peru).

This report was intended as a first step towards developing some systematic knowledge about the production and distribution of alpaca meat in Peru. The report summarizes the meager literature that has been available and presents new information obtained from research done at the Santa Rosa slaughter house and other production and distribution sites in Southern Peru. Alpaca meat is distributed both through official and unofficial marketing systems. Alpaca produced by Indian producers tend to be either locally consumed or illegally distributed. Animals produced in the cooperatives are marketed through legal channels. The main consumption center for legal red meat is the city of Arequipa, while most of the legal charqui is consumed in the lowlands of the department of Cuzco.

PB84-192699/GAA PC **A04**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Social Aspects of Small Ruminant Production: A Comparative Study of West Java, Indonesia (Aspek Sosial Usaha Ternak Ruminansia Kecil: Studi Bandingan di Jawa Barat, Indonesia),
K. Suradisastra, and M. F. Nolan. Jan 83, 64p TRS-19
Grant AID/DSAN/XII-G-0049
Text in English, summaries in English and Indonesian. Prepared in cooperation with Missouri Univ.-Columbia. Dept. of Rural Sociology, and Central Research Inst. for Animal Husbandry, Bogor (Indonesia).

Keywords: *Farming, *Crops, *Animal husbandry, *Ruminants, Production, West Java, Farms, Farm crops, Developing countries, *Indonesia, Developing country application, Ownership.

A study was conducted to find the social, economic and biological characteristics of small ruminants in West Java. One hundred and forty-five sheep farmers in the upland area of Garut was selected as respondents. The lowland area of Cirebon was represented by 100 farmers. The sample was divided into 5 strata based on land ownership. The results showed a distinct difference between the two areas. While multi-cropping patterns dominated the upland area, a wet rice monoculture system was a common practice among the lowland farmers. Individual ownership of small ruminants was also dominated by the pattern of animal ownership in the upland areas. By contrast, sharing arrangements of small ruminants was widely practiced by lowland farmers. But in both study sites, the number of small ruminants raised was not related to land ownership.

PB84-192715/GAA PC **A05**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Regional Structure of Distribution of Mutton in Cusco, Peru,
G. Primov, and L. Jimenez-Zamalloa. May 81, 82p TRS-3
Grant AID/DSAN/XII-G-0049
Text in English, summaries in English and Spanish. Prepared in cooperation with Missouri Univ.-Columbia. Dept. of Rural Sociology.

Keywords: *Land use, *Ruminants, Statistical data, Urban areas, Marketing, Supply(Economics), *Peru, Developing countries, Cusco(Peru), Developing country application.

The purpose of this project was to establish the general outline or pattern of the distribution of mutton in a region in the southern Peruvian Andes. Since Cusco is the largest city located within the high Andean region of southern Peru, this city was assumed to act as the primal center of the regional distribution network. There exist two separate but partially overlapping structures of distribution associated with the production of sheep, and alpaca as well. One structure is associated with the marketing of wool while the other centers around the distribution of meat.

PB84-192723/GAA PC **A04**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Organizational Dialectics of Animal Management,
C. M. McCorkle, and L. Jimenez-Zamalloa. Apr 82, 54p TRS-6
Grant AID-DSAN/XII-G-0049
Prepared in cooperation with Stanford Univ., CA. Dept. of Anthropology, and Missouri Univ.-Columbia. Dept. of Rural Sociology. Text in English, abstracts in English and Spanish.

Keywords: *Livestock, Societies, Manpower, Demand(Economics), Conflicts, Rural areas, Economic development, Socioeconomic status, Recommendations, Developing country application, Herding.

This report is part of a series of publications about the management of livestock in an indigenous Andean community. The topic addressed here relates to the social organization of herding and how the community organizes the necessary human resources for the daily care of its herds. Given a nuclear family the hand labor required by the demands of crop production, and the variety of animals that each family tries to maintain, the labor problem is critical. The socio-economic associations described here allow families to accomplish both herding and agricultural activities. Pastoral associations diminish the labor conflicts implicit in agro-pastoral systems. The report concludes with some suggestions on some practical consequences for rural development projects plus some new directions for theorical studies in other agro-pastoral societies.

PB84-192731/GAA PC **A05**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Comparative Study of the Organization, Management and Husbandry Practices of Three Sheep Production Units in the Central Sierra of Peru,
D. Martinez-Castilla. Jan 83, 78p TRS-11
Grant AID/DSAN/XII-G-0049
Prepared in cooperation with Winrock International, Morrilton, AR. and National Agrarian Univ., Lima (Peru). Dept. of Economics and Planning.

Keywords: *Animal husbandry, Sierra Mountains, *Ruminants, Production, Management, Andean highlands, Grazing land, Resources, Peru, Developing countries, Central Region(Peru), Developing country application.

The report presents a comparative study of the organization, management, and husbandry practices of three sheep production units in the Central Sierra of Peru. Agrarian reform in Peru has impacted directly upon the large scale grazing units in the Andean highlands. This report describes the evolution of three types of organizational forms which have developed in the Department of Pasco in the Central Sierra. Sheep production is the primary activity. The production environment is described in detail including ecology, vegetation, animal resources, infrastructure, labor allocation, and management practices. Enterprise accounting data is analyzed to construct efficiency measures of sheep flock performance and measures of household income.

PB84-193036/GAA PC **A06**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Technoenvironmental Dialectics of Herding in Andean Agropastoralism,
C. M. McCorkle, and L. Jimenez-Zamalloa. Jul 83, 111p TRS-30
Grant AID-DSAN/XII-G-0049
Text in English, abstracts in English and Spanish. Prepared in cooperation with Missouri Univ.-Columbia. Dept. of Rural Sociology.

Keywords: *Animal husbandry, Management, *Ruminants, Andes mountains, *Livestock, Grazing land, Breeding, Comparison, Farms, Developing countries, *Peru, Developing country application.

This report is part of a series studying the nature of agricultural herding in an Andean community. The first part of the report describes the annual cycle of pastoral duties: rites of protection and reproduction of the herds, shearing, the castration, breeding, and the means for genetic control, seasonal patterns of grazing, and the use of supplementary forage. The second part considers on-cyclic aspects of the handling of animals; the infrastructure and pastoral tools; the composition of herds by species, sex, and age; the production of losses of livestock and its causes; and the control of predators. These aspects of herding are compared with modern commercialized husbandry.

PB84-193051/GAA PC **A04**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Small Ruminant Production in Sertao of Ceara, Brazil: A Sociological Analysis,
G. Primov. Jun 82, 73p TRS-15
Grant AID/DSAN/XII-G-0049
Text in English, abstracts in English and Portuguese. Prepared in cooperation with Missouri Univ.-Columbia. Dept. of Rural Sociology.

Keywords: *Crops, *Animal husbandry, *Ruminants, Production, Sociology, Livestock, Farm crops, Sheep, Goats, Developing countries, *Brazil, Developing country application.

Twenty-nine producers in the State of Ceara were interviewed about the relative importance of small ruminant production. The land configuration of some farms acts as a constraint on livestock production. Sheep were produced in farms of all sizes and were more numerous than goats, which tended to be absent in the smaller farms. The major deterrant against goat production is the need to supervise or fence the animals. Livestock production tended to be strongly integrated with crop production. Producers relied more heavily on their small ruminants in the dry seasons and during drought years. Sheep are produced more for market sale while goats are used primarily for home consumption. Lack of water is regarded as the major constraint on small ruminant production.

PB84-193085/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Role of Faculties of Agriculture in the Development of the Food Processing Industries,
M. M. Aref. 17 Jan 84, 42p UNIDO/PC.93, V-84-80504

Keywords: *Food, *Agriculture, *Industrial development, Meetings, *Food processing, Education, Africa, Developing country application.

This expert report on the role of faculties of agriculture in development of food industries covers (1) the role of such faculties in food technology education, food research, industrial services, technical assistance and consulting (2) prospective functions for faculties of agriculture in Africa. Annexes subject matter outlines for food-oriented training programs.

PB84-193093/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Industrial, Marine, and Recreational Applications of Carbon Fibres and Their Composites,
I. L. Kalnin. 2 Feb 84, 24p UNIDO/ID/WG.416/8, V-84-81161

Keywords: *Carbon fibers, Composite materials, *Industrial plants, Recreation, Medical supplies, Electrical equipment, Developing country application.

UNIDO pub on applications of carbon fibers and their composites - covers (1) industrial applications in structures and parts (2) application in (a) medical equipment and surgery (b) in electrical equipment (c) in ships and sports goods, loudspeakers and musical instruments. Tables. Additional references: corrosion, electrodes, radio sets.

PB84-193101/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Industrial and Further Applications of Carbon Fibres: Special Experience in Europe,
B. J. Hayes. 2 Feb 82, 11p UNIDO/ID/WG.416/10, V-84-81162

Keywords: *Carbon fibers, *Europe, *Industrial plants, Forecasting, Composite materials, Injection molding, Reinforced plastics, Robots, Developing country application.

UNIDO pub on industrial applications of carbon fibers in Europe - covers (1) use of carbon fiber composites in automobiles, torque tubes and drive shafts; development in the field of robot construction; use in sports goods (2) application in aircraft industry and boat components. Additional references: injection moulding, ships, bicycles, choice of technology, prepreg system.

PB84-193341/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Heat Diagnoses Made on Tunnel Kilns and on Belt Drier: Basic Information,
M. Novay. 30 Jan 84, 46p UNIDO/IO.572, V-84-80997

Keywords: *Ceramics, Measurement, *Energy conservation, Energy use, Developing country application.

A report is made on diagnostic measurements of heat consuming units in the ceramics industry from the point of view of their operation, adjustment and energy saving. It covers technical parameters, objective of measurement, diagnostic method and applied apparatuses, testing results and their evaluation for (1) tunnel kiln for firing wall tiles (2) belt drier for washed kaolin.

PB84-193358/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Comparison of High Modulus Fibres,
R. J. Diefendor. 2 Feb 84, 12p UNIDO/ID/WG.416/3, V-84-81156

Keywords: *Fibers, *Plastics, Comparison, Composite materials, *Metals, Ceramics, Polymers, Performance evaluation, Fiberglass reinforced plastics, Chemical vapor deposition, Developing country application.

UNIDO pub on new materials, with special reference to high modulus fibers (reference: manmade fibers) - (1) defines requirements for high modulus fibers used mainly as reinforcement in resins, metals or ceramics matrix composites (2) covers fiber processes: glass melt spinning; chemical vapor deposition; carbon fibers, silicon carbide fibers, alumina fibers; organic fibers (3) compares present fiber performances within context of desired composite requirements. Diagrams. Additional references: fiberglass, polymers.

PB84-193366/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Carbon Fibres and Their Application,
E. Fitzer. 2 Feb 84, 50p UNIDO/ID/WG.416/1, V-84-81154

Keywords: *Carbon fibers, *Industrial plants, Mechanical properties, Forecasting, *Economic analysis, Aerospace industry, Transportation systems, Machinery, Cryogenics, Medical supplies, Reinforced plastics, Fiber composites, Composite materials, Developing country application.

UNIDO pub on carbon fibers and their industrial applications - covers (1) the nature of carbon fibers (2) their properties and possibilities for further improvement: nomenclature; mechanical properties; future development potential (3) economic aspects: present technology; carbon fibers as heavy tow; production capacity, world demand and prices (4) application: aircraft industry, transport, machinery and apparatus, cryogenic application; medical application. Illustrations. Additional reference: new materials.

PB84-193663/GAA PC **A02**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Profile of Sheep and Goat Markets in West Java, Indonesia,
M. Sabrani, S. Mawi, T. D. Soedjana, and H. C. Knipscheer. May 83, 21p TRS-12
Grant AID/DSAN/XII-G-0049
Prepared in cooperation with Winrock International, Morrilton, AR. and Research Inst. for Animal Production, Bogor (Indonesia).

Keywords: *Land use, *Animal husbandry, *Ruminants, Farms, West Java, Surveys, Resources, Land, *Indonesia, Developing countries, Developing country application.

This paper characterizes selected small ruminant (sheep and goat) production systems and their economic role on small farms in West Java. It is a preliminary report of a baseline survey that has been made of an upland and a lowland ecozone, both of which are representative of large areas in West Java. An objective of this survey, for which data were collected in 1981, was to provide the basic socioeconomic information necessary to understand farmers' conditions and operating constraints. The reported results were intended to be used for the formulation of appropriate biological research programs, and include information on labor use, land holdings, capital, water and feed resources, and animal resources.

PB84-193671/GAA PC **A02**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Statistical Analysis of Small Ruminant Supply in Ceara State, Northeast Brazil,
J. de Souza Neto, N. Gutierrez, and J. De Boer. Jan 84, 22p TRS-37
Grant AID/DSAN/XII-G-0049
Text in English, abstracts in English and Portuguese. Prepared in cooperation with Winrock International, Morrilton, AR.

Keywords: *Ruminants, *Food, Sheep, Goats, Supply(Economics), Inventories, Econometrics, Prices, Developing countries, *Brazil, Developing country application.

In the state of Ceara, the variation in the supply of agricultural products in the market reflects extremes of seasonal climatic variation and relative price relationships. This work had the objective of developing an econometric model of sheep and goat inventories and supply for slaughter as well as an empirical analysis of producer behavior in relation to marked variations in weather. Two-stage least squares method was used to estimate the model parameters. Inventories of sheep and goats were formulated as a function of prices, weather conditions and lagged inventories, presenting similar results in both cases and reflecting similar production and price structures.

PB84-193770/GAA PC **A06**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Alpaca Production in Puno, Peru,
T. L. West. Aug 81, 115p TRS-4
Grant AID/DSAN/XII-G-0049
Text in English, abstracts in English and Spanish. Prepared in cooperation with Missouri Univ.-Columbia. Dept. of Rural Sociology.

Keywords: *Animal husbandry, Production, *Livestock, Inventories, Regions, Management, Breeding, Veterinary medicine, Agricultural products, Developing countries, *Peru, Puno(Peru), Developing country application.

A collection of data and comments about the production of alpacas in the department of Puno, Peru, is presented. The first chapter deals with the livestock census, especially the ones from 1978, analyzing them principally by province, type of animal, and unit of production. A second theme is the description of the technique of managing the alpaca utilized by some of the producers of Puno's high Puna. Among these producers there are traditional shepherds and specialized breeders of alpacas. The diagnosis and treatment of the illnesses, the reproduction, the handling of the herd, the shearing, and the availability of the products are key points in this section. The last chapter deals with the use and marketing of small ruminants in Puno.

PB84-193903/GAA PC **A04**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Management of Animal Health and Disease in an Indigenous Andean Community,
C. McCorkle. Jan 82, 72p TRS-5
Grant AID/DSAN/XII-G-0049
Prepared in cooperation with Stanford Univ., CA. Dept. of Anthropology, and Missouri Univ.-Columbia. Dept. of Rural Sociology. Text in English, abstracts in English and Spanish.

Keywords: *Ruminants, *Animal diseases, Control, *Veterinary medicine, Management, Prevention, Livestock, Efficiency, Abnormalities, Developing country application.

This report is a part of a series of publications about the agricultural herding in an Andean community. The present work describes ethnoveterinarian management of small ruminants. It documents the 'folk' classification, the ethnoetiology (natural or supernatural) of disease, the techniques of control of prevention of livestock diseases that are most common in the community, and the treatment of these. The data is compared systematically with those supplied by modern veterinary medicine. This way it is possible to analyze the reach of the veterinary knowledge of the Indians and the efficiency of the resulting practices. This analysis reopens the old debate over the rationality of peasants. Of course, peasants are not aware of much technical veterinary information. But apparently, in an 'irrational' manner, they do not use the knowledge that they do possess--especially to prevent or to control epidemics among their herds.

PB84-193929/GAA PC **A02**/MF **A01**
Southern Forest Experiment Station, New Orleans, LA.

Ten-Year Growth of Five Planted Hardwood Species with Mechanical Weed Control on Sharkey Clay Soil.
Forest Service research note.
R. M. Krinard, and H. E. Kennedy, Jr. Dec 83, 6p
FSRN/SO-303

Keywords: *Weed control, *Woods, Clay soils, Planting, Clearing, Spacing, Competition, Agricultural machinery, Soil properties, Soil moisture, Survival, Fraxinus pennsylvanica, Mowing.

Five Hardwood species planted on Sharkey clay soil showed little practical difference in growth whether plots were mowed or disked for weed control in year 6 to 10, although disking had given better growth in the first 5 years.

PB84-193952/GAA PC **A09**/MF **A01**
Cal Recovery Systems, Inc., Richmond, CA.
Integrated Energy-Agro-Waste Systems for Small-Scale Farms.
Rept. on Phase 1,
J. C. Glaub, G. M. Savage, D. J. Lafrenz, and L. F. Diaz. Apr 82, 186p* NSF/CEE-82139
Grant NSF-CEE81-13803

Keywords: *Fertilizers, *Energy source development, *Waste disposal, *Biomass, Fuels, Agricultural wastes, Aquaculture, Mathematical models, Livestock, Process charting, Agricultural products, Farm crops, Anaerobic processes, Manure.

The feasibility of integrated farming systems for small-scale farms, particularly those smaller than 100 acres, is investigated. Quantitative unit process models are developed for the following agricultural, aquacultural, and waste treatment processes: broiler chickens, layer chickens, beef cattle, dairy cattle, swine, catfish, carp, tilapia, alfalfa, barley, corn, oats, rice, sorghum, wheat, algae, and anaerobic digestion. These models are then combined into an integrated complex and mass balances of the entire complex are performed for each of the complexes considered. The most promising integrated complexes are said to be swine-algae-carp-corn; swine-digester-algae-carp-corn; layer chicken-digester-corn; and layer chicken-algae-tilapia-corn. All of the complexes are said to be technically feasible.

PB84-194018/GAA PC **A02**/MF **A01**
Southern Forest Experiment Station, New Orleans, LA.
Termite Control Studies in Panama.
Forest Service research note.
R. H. Beal. Dec 81, 8p FSRN/SO-280

Keywords: *Pest control, *Insects, *Tropical regions, Damage, Control, Barro Colorado Island, Field tests, Panama Canal, Soil tests, DDT, Insecticides, Dieldrin, Panama, Canals.

Subterranean termite control studies in a tropic area (Panama) are described. Testing was first started in 1943 on Barro Colorado Island, which was formed when the Panama Canal was completed in the early 1900's. Materials tested included DDT (various concentrations and formulations), BHC, trichlorobenzene, sodium arsenite, pentachlorophenol, sodium flurosilicate, copper ammonium fluoride, aldrin, chlordane, dieldrin, and heptachlor. Dieldrin applied to the soil as a water emulsion, was still 100 percent effective after 27 years when the tests were terminated. Tests with aldrin, chlordane, and heptachlor were initiated in 1963 and all three chemicals were still 100 percent effective after 16 years.

PB84-194281/GAA PC **A07**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Casuarinas: Nitrogen-Fixing Trees for Adverse Sites.
Final rept.
Apr 84, 132p R-43
Grant AID-DAN-5538-G-SS-1023
Library of Congress catalog card no. 84-060045.

Keywords: *Land use, *Forestry, *Soil erosion, Reforestation, Soil erosion, Fuels, Swamps, Mountains, Sites, Growth, Tropical regions, Semiarid land, Australia.

This book highlights 19 species of casuarina, a group of Australasian trees that could have potential in reforesting difficult terrain in many parts of the world. This book describes the different species, discusses their management and uses, and then gives recommendations and research needs. Casuarinas are robust, nitrogen-fixing trees that can be planted on harsh, eroding land to provide fuel and other products. Species for tropical lowlands and highlands, termperate zones and semiarid regions are highlighted.

PB84-194646/GAA PC **A09**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Potential Collaboration in Science and Technology: Proceedings of a Symposium on Indonesia Held at Washington, DC on October 3-5, 1983.
Final rept.
Mar 84, 183p R-84-1
Contract AID-497-79-100-23

Keywords: *Energy, *Electronics, *Indonesia, Marine sciences, Electronics industry, Telecommunication, *Industrial development, Transit industries, Machine tool industry, Energy industries.

Held in Washington, D.C., October 3-5, 1983, this meeting was intended to act as a forum for exchanging information and identifying opportunities for mutually beneficial collaboration in the areas of marine sciences, post harvest technology, engineering and machine tool industries, telecommunications and electronics, land transportation industries and energy industries. This public symposium was intended to better acquaint the U.S. private and public sectors with the goals of Indonesia's fourth five-year development plan.

PB84-194661/GAA PC **A06**/MF **A01**
National Research Council, Washington, DC. Board on Science and Technology for International Development.
Workshop on Systems Analysis: Summary Report Held at Jakarta (Indonesia) on February 8-12, 1983.
Final rept.
Apr 84, 115p R-84-2
Contract AID-497-79-100-23

Keywords: *Food, Urban transportation, *Indonesia, Management information systems, *Waste management, Transportation, Food industry.

In 1982, Indonesia's Agency for the Assessment and Application of Technology (BPPT) invited BOSTID to join it in sponsoring a workshop on systems analysis (S/A). This workshop explored the use of S/A as a tool for attaining development goals. Particular focus was given to illustrative studies focusing on Indonesian concerns with solid waste management, urban transportation, and the food systems. Addressing these concerns were scientists, engineers, development specialists, administrators and educators.

PB84-195080/GAA PC **A02**/MF **A01**
Southern Forest Experiment Station, New Orleans, LA.
Response of Newly Established Slash Pine to Cultivation and Fertilization.
Forest Service research note.
A. E. Tiarks, and J. D. Haywood. 1981, 6p FSRN/SO-272

Keywords: *Fertilizers, *Pine trees, *Weed control, Cultivation, Grasses, Loams, Height, Measurement, Competition, Louisiana, Slash pine trees.

Response of newly established slash pine to fertilization is increased if herbaceous plants are controlled.

PB84-195809/GAA PC **A09**/MF **A01**
Arkansas Water Resources Research Center, Fayetteville.
Disposal of Household Wastewater in Soils of High Stone Content (1981-1983),
E. M. Rutledge, C. R. Mote, D. T. Mitchell, M. S. Hirsch, and M. D. Harper. Dec 83, 197p PUB-103, OWRT-B-060-ARK(1)
Contract DI-14-34-0001-1204
See also PB83-243188. Prepared in cooperation with Arkansas Univ., Fayetteville.

Keywords: *Sewage disposal, *Soils, Filtration, Residential buildings, Hydraulic conductivity, Stresses, Ammonia, Inorganic nitrates, Carbon, Organic compounds, Chert, Silts, Loams, Geomorphology, Soil properties, Fragipan soils.

Four experimental filter fields were constructed with built-in monitoring equipment in Nixa soils, containing chert fragments, and a fragipan (the design limiting feature) at 60 cm. The four were (1) a 'standard' field, 76 cm deep, in the pan; (2) a 'modified standard', 30 cm deep, above the pan; (3) a 'modified pressure' field, 40 cm deep, above the pan, with pressure distribution, and (4) a 'modified pressure' field, 6 cm below the soil surface. Placing filter fields higher in the soil above the pan led to improved hydraulic performance. Approximately a 50% reduction of TOC occurred within all beds, with further reductions of 30% to 40% within 60 cm of the beds. There was a significant reduction in the total of NH3 and NO3 concentrations with distance from the beds.

PB84-195841/GAA PC **A08**/MF **A01**
Ionics, Inc., Watertown, MA.
Reference Plant for High Temperature Electrodialysis Desalting of Seawater.
Final rept.,
E. J. Parsi, T. A. Prato, and T. A. Susa. 28 Jul 83, 160p*
Contract DI-14-34-0001-7525

Keywords: *Industrial plants, *Desalination, Pilot plants, Feasibility, Membranes, High temperature tests, Field tests, Ion exchanging, Economic analysis, Design criteria, Process charting, Wrightsville Beach Desalination Plant.

The objectives of this project was to establish the feasibility of High Temperature Electrodialysis (HTED) in a seawater desalting reference plant. The goal was to increase the energy efficiency and economics of seawater desalting over conventional electrodialysis by operating at temperatures ranging up to 140F, using improved membranes, and incorporating innovations in the membrane stack and process design. A 30,000 GPD reference plant (expandable to 50,000 GPD) was designed, built and installed at the Wrightsville Beach Test Facility. Field testing was halted by the shutdown of the facility at the end of March, 1983, however, the abbreviated field test demonstrated the efficacy of most of the novel features, and an energy consumption of 40 KWH/Kgal was projected at 4 GFD, 130F, and 50% water recovery.

PB84-196260/GAA PC **A02**/MF **A01**
United Nations Industrial Development Organization, Vienna (Austria).
Wind-Power Vessels for Coastal and Inter-Island Use in the ESCAP (Economic and Social Commission for Asia and the Pacific (UN), Bangkok (Thailand) Region.
1984, 22p UNIDO-ID/WG.413/2, V-84-80839
Paper presented at meeting on Shipbuilding and Shiprepair Development for Asian and the Pacific Countries held at Jakarta (Indonesia) on March 26-31, 1984.

Keywords: *Ships, *Wind energy, *Technology assessment, Specifications, Shipyards, *Wind power, Developing country application.

The report describes the use of wind energy for ships in the ESCAP region. It covers wind power in shipping: the sailing ship; speed performance; sailing performance; sail material; sail handling, an outline specifications: class; principal dimensions and specifications; hull; hatch covers, deck strength; superstructure; accomodation; machinery; sails, low or medium technology shipyards: level of technology required; how to simplify; shipyard layout.

PB84-196278/GAA PC **A03**/MF **A01**
United Nations Industrial Development Organization, Vienna (Austria).
Biotechnology for Food Conversions in the Third World: Development, Transfer and Implementation,
G. Viniegra-Gonzalez. 1983, 31p UNIDO-ID/WG.412/6, V-84-80330
Paper prepared for seminar/workshop on 'Technology Transfer, Management and Development and the Implications of Newly-Emerging Advanced Technologies' held at Port-of-Spain, Trinidad and Tobago, November 8-12, 1983. Prepared in cooperation with Universidad Autonoma Metropolitana, Mexico City.

Keywords: *Food processing, *Technology transfer, *Nutrition, Substitutes, Feeding stuffs, Cattle, Starches, Molasses, Proteins, Developing country application.

The report discusses the use of biotechnology in food production based on experience in Mexico and covers the following topics: (1) the increasing problem of competitive human and animal nutrition in developing countries; the use of biotechnology in developing substitutes for cereals and feed for cattle; microbial food conversion; (2) and potential users in the Third World.

PB84-196286/GAA PC **A04**/MF **A01**
United Nations Industrial Development Organization, Vienna (Austria).
Advances in Materials Technology: Monitor. Issue Number 1.
1983, 64p V-83-64212

Keywords: *Steel industry, Low alloy steels, Developing countries, Alloy steels, Developing country application.

The report contains information on new materials, with special reference to high strength low alloys steel. It covers (1) advances in materials and related technological changes; their implications for developing countries (2) manufacturing alloy steels (based on experience in USA (3) new materials, products and processes in the field of alloy steel production; developments in the DCs; information sources; cooperation; technology transfer; research; testing (4) the role of UNIDO in promotion of iron and steel industry.

PB84-196963/GAA PC **A07**/MF **A01**
Arizona Univ., Tucson. Office of Arid Lands Studies.
Draft Environmental Profile on the Republic of Costa Rica,
J. Silliman. Jul 81, 130p AID-PN-AAK-024
Contract NPS-CX-0001-0-0003

Keywords: *Environmental surveys, *Natural resources, *Costa Rica, Minerals, *Land use, Climate, Water resources, Soils, Pollution, Demography, Developing country application, Energy resources.

Despite its relatively small size, Costa Rica is endowed with a rich variety of physical and biological resources. Nonetheless, destruction of forests, degradation of the land, and the Costa Rican Government's lack of relevant information and expertise are pressing problems. This report presents a preliminary review of information available on Costa Rica's natural resources and environment, including the nation's geography, climate, demography, land use patterns, mineral and water resources, soils, flora and fauna, and environmental pollutants. Appended are surveys of water supplies and energy resources, reviews of environmental legislation and relevant USAID/CR programs, a list of government agencies with environmental responsibilities, and a 146-item Spanish and English bibliography.

PB84-197029/GAA PC **A03**/MF **A01**
Westinghouse Health Systems, Columbia, MD.
Contraceptive Prevalence Survey: Model Questionnaire (Encuesta de Prevalencia del Uso de Anticonceptivos: Cuestionario Modelo)(Etude de Predominance des Methodes Contraceptives: Questionnaire Modele).
12 Sep 78, 45p AID-PN-AAJ-985
Contract AID/pha-C-1194
Text in English, Spanish, and French.

Keywords: *Birth control, *Contraceptives, Surveys, Questionnaires, Marriage, Characteristics, Children, Developing country application.

Contraceptive Prevalence Survey (CPS) is an international research program designed to assist developing countries in carrying out periodic surveys of use and knowledge of family planning. This document presents a model questionnaire designed to elicit contraceptive information from the survey universe, i.e., all women of reproductive age (15-49) regardless of marital status. The CPS respondent's profile is derived from 12 questions. Age and date of birth are asked to determine whether the respondent is within the survey universe. Marital status, which serves as a surrogate measure of sexual activity, is asked at the end to avoid interviewer and respondent bias because of the sensitive nature of certain questions. Place of residence is asked to determine rural/urban or regional breakdowns of contraceptive use. Questions are asked on education, work, and ethnic background to compare contraceptive use through-out societal strata. Questions on pregnancies and live births and number of living children by sex are asked to verify parity differentials, establish a crude birth rate, and identify women who do not need contraception. Desire for additional children is determined to indicate a respondent's potential for contraceptive use and to differentiate contraceptive spacers from non-spacers. Questions on the knowledge and use of contraceptives are the most important in the survey and serve as analytical focal points for all other variables. Questions are also asked on the availability of contraceptives used (cost and transportation to and convenience of location) in order to assess program work load and measure the relative contributions of public and private contraceptive sources and to gain insights into the reasons for non-use. Finally, the reason for non-use is explicity asked.

PB84-197490/GAA PC **A02**/MF **A01**
Southern Forest Experiment Station, New Orleans, LA.
Controlling Shrubs on Wet Slash Pine Sites.
Forest Service research note,
L. F. Smith. 1963, 4p FSRN/SO-4

Keywords: *Weed control, *Pine trees, *Herbicides, Sites, Cutting, Spraying, Diesel fuels, Chlorine aromatic compounds, Chlorine organic compounds, Mississippi, Stumps, T 2-4-5 herbicide, Acetic acid/trichlorophenoxy.

This paper reports the effects of five 2,4,5,-T spray treatments on under-story shrubs bordering a stream in south Mississippi.

PB84-198027/GAA PC **A05**/MF **A01**
Colorado State Univ., Fort Collins. Dept. of Economics.
Experiment With Farm Record Keeping in the Dominican Republic.
Occasional paper,
R. L. Tinnermeier, and T. M. Dickey. Nov 81, 85p OP-8, AID-PN-AAK-028
Contract AID-ta-BMA-6
Portions of this document are not fully legible.

Keywords: *Farming, *Crops, *Financial management, Operations, Farm crops, Production, *Dominican Republic, Developing country application.

Farm records detailing the history of a farmer's operation are widely used in developing countries to provide data for farm and sector analysis and for loan evaluation. This study describes an experiment to introduce farm record keeping to small farmers in the Dominican Republic.

PB84-198092/GAA PC **A06**/MF **A01**
Colorado State Univ., Fort Collins. Dept. of Economics.
Collection of Farm Production Data for Credit Programs in Developing Countries.
Occasional paper,
R. L. Tinnermeier, T. M. Dickey, and J. D. Longwell. Nov 81, 108p OP-7, AID-PN-AAK-034
Contract AID/ta-C-3

Keywords: *Productivity, *Financial management, *Farming, Production, Data, *Dominican Republic, *Honduras, Developing country application.

Farm enterprise budgets and farm records are two sources of farm production data which can significantly help developing country credit agents make sound credit decisions on existing or potential borrowers. This study reviews these two data sources in Honduras and the Dominican Republic and suggests ways to improve their use and extend that use to other developing countries.

PB84-198100/GAA PC **A05**/MF **A01**
International Statistical Inst., Voorburg (Netherlands).
Illustrative Analysis: Socio-Economic Differentials in Cumulative Fertility in Sri Lanka - A Marriage Cohort Approach.
R. J. A. Little, and S. Perera. Mar 81, 81p R-12, AID-PN-AAK-009
Prepared in cooperation with World Fertility Survey, London (England).

Keywords: *Women, *Fertility, *Sri Lanka, Surveys, Characteristics, Ethnic groups, Urban areas, Rural areas, Marriage, Employment, Females.

Given a dramatic decline in fertility over the past three decades in Sri Lanka, policymakers wished to determine whether fertility had declined equally among different socioeconomic, ethnic, and regional groups. Hence, a cohort analysis of fertility differentials (FD's) was performed using data from the 1975 Sri Lanka World Fertility Study. Women respondents were divided into three cohorts defined by the number of years married--20 or more years, 10-19 years, and less than 10 years. Each group's fertility rates were differentiated according to ethnic group (four major ones exist), zone of residence (six were delineated), category of residence (rural, urban, or tea/rubber plantations), education, religion, and husband's occupation.

PB84-198118/GAA PC **A09**/MF **A01**
Michigan State Univ., East Lansing.
Poor Rural Households, Technical Change, and Income Distribution in Less Developed Countries: A Summary Report of Findings from West Africa, Southeast Asia and Brazil.
Mar 80, 199p AID-PN-AAJ-982
Contracts AID/ta-C-1328, AID/ta-C-1327
Sponsored in part by Contract AID/ta-C-1326.

Keywords: *Economic analysis, *Farming, *Agricultural machinery, *Rural areas, Economic factors, Income, West Africa, Southeast Asia, Brazil, Developing country application, *Households, Poverty.

To help solve the riddle of why many developing country farmers continue to live in abject poverty while new farm technology is steadily increasing aggregate farm output, this report summarizes and compares studies conducted in selected sites in West Africa, Southeast Asia, and Brazil on the use of new farm technology and its impact on the rural poor.

PB84-198126/GAA PC **A04**/MF **A01**
Board for International Food and Agricultural Development, Washington, DC.
Increasing Agricultural Production through More Effective Use of Technology: Recommendations for a Strengthened Agricultural Extension Program in Egypt.
Nov 81, 60p AID-PN-AAJ-984

Keywords: *Technology transfer, *Agriculture, *Productivity, *Egypt, Developing countries, Technology, Recommendations, Research, Project management, Developing country application, Agricultural extension programs, ARE programs.

Current technology could significantly increase Egypt's agricultural productivity and provide more food for the country's population, which will double in the next 20 years. Against a background description of Egypt's agricultural needs and potential, this report presents the findings and recommendations of a U.S. team which reviewed Egypt's agricultural research and extension (ARE) programs.

PB84-198159/GAA PC **A07**/MF **A01**
Public Health Service, Washington, DC.
Breast Is Best: An International Bibliography on Breast Feeding and Infant Health,
N. Baumslag, L. Grace-Mason, C. Roesel, and E. Sabin. Jun 80, 143p AID-PN-AAK-023
Contract AID-782-77-0132
See also PB80-154669.

Keywords: *Health, *Nutrition,*Breastfeeding, Nutritional deficiency diseases, Humans, Morbidity, Mortality, Diarrhea, Reproduction(Biology), Food industry, Developing country application, Weaning.

It has been estimated that of the 15 million developing country children under age 5 who die each year from the combined effects of malnutrition and infection, as many as 10 million could be saved if breast-feeding was generally practiced. Despite the clear nutritional and immunological advantages of human breast milk, however, the practice of breast-feeding is declining in many developing countries. A key factor may be lack of proper information on breast-feeding by health professionals. To redress this problem, this international bibliography on breast-feeding and infant health provides information needed for a better understanding of the technical and social aspects of breast-feeding as well as a framework for coordinating nutrition and health planning efforts in developing countries. Annotated bibliographic entries are grouped according to seven categories: (1) maternal nutrition; (2) breast-feeding practices; (3) support and promotion of breast-feeding; (4) composition of human breast milk; (5) impact of feeding practices on morbidity and mortality; (6) breast-feeding and reproduction; and (7) infant formula and weaning foods.

PB84-200443/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Strategies for Increasing the Production of Tanning Chemicals in Developing Countries.
Sectoral working paper series no. 17.
1984, 72p UNIDO/IS.448

Keywords: *Productivity, *Leather, *Chemical industry, Chemical properties, Utilization, Chemical compounds, Economic analysis, Developing country application.

UNIDO pub on increasing production of tanning chemicals in developing countries - covers (1) production of leather to 2000 (2) tanning chemicals: properties and uses; general purpose chemicals; basic tanning chemicals; performance chemicals; bates, bactericides, synthetic materials, oils and fats, dyeing auxiliaries, dyes, leather finishes (3) requirements 1980-2000; development potential for production in DCs; technical and economic aspects; infrastructure and logistics; government policies (4) choice of technology; possibility for substitutions (5) strategies for development; modalities for cooperation. Statistics. Additional references: sodium, chloride, ammonia, sulphate, sulphuric acid, sodium carbonate, calcium.

PB84-200450/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Facilities and Technical Aspects of Shipbuilding and Shiprepair in Bangladesh,
A. K. M. W. Ali. 7 Mar 84, 10p UNIDO-ID/WG.413/3, V-84-82402

Keywords: *Ships, *Boats, *Bangladesh, *Technology transfer, Water transportation, Maintenance, Financing, Developing country application, Infrastructure, Workshops.

This report covers (1) dependence on sea transport and inland water transport (2) the Chittagong dry dock; maintenance and repair of ocean-going ships; available facilities; required workshops and training (3) arranging for technology transfer; problems of financing (4) proposal for TCDC.

PB84-200468/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Shipbuilding and Repair Develpment in Papua New Guinea,
G. H. Orere. 7 Mar 84, 38p UNIDO-ID/WG.413/4, V-84-82973

Keywords: *Ships, *Boats, *New Guinea, Water transportation, Raw materials, Market, Maintenance, Developing country application, Infrastructure.

This report covers (1) significance of inland water transport and sea transport; traditional boat building skills and updated knowhow (2) categories of boat building: village community; village commercial; church missions; public sector; private enterprises (3) hull maintenance and repair; marine engineering (for engines) (4) the consumer component; types of ships operators; the fishery industry; marine engine distribution; timber and other raw materials; training (5) the domestic market; infrastructure; equipment and facilities; technical assistance (6) strategies for development.

PB84-200476/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Agricultural Machines and Implements in Kenya,
T. M. J. Gitonga. 9 Mar 84, 24p UNIDO-ID/WG.418/8, V-84-83194

Keywords: *Agricultural machinery, *Kenya, *Technology transfer, Economic analysis, Tools, Technology, Government policies, Financing, Raw materials, Industrial development, Developing country applications.

This report covers (1) present state of farming (2) nature and sources of machinery and tools; imports; list of domestic factories; research and development (3) problems hindering proper technology development and technology transfer as well as domestic production and marketing, skilled workers, financing, raw materials, quality control; need for international and regional cooperation (4) technology policy and industrial development (5) proposed solutions; improvements of licensing and joint venture arrangements; cooperation.

PB84-200484/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Agricultural Machinery Industry in the Philippines,
C. L. Follosco. 1984, 23p

Keywords: *Agricultural machinery, *Philippines, *Technology transfer, Manufacturing, Technology, Government policies, Economic analysis, Exports, Imports, Marketing, International trade, Industrial development, Developing country application, Institutions.

This report covers (1) the agricultural mechanization situation; exports, imports; mechanization trends; trends in developed countries and in Asia (2) government policies and programs; institutional framework (3) manufacturing situation: products manufactured, power tillers, rice threshers; basic facilities; subcontracting arrangements; standardization and quality control; manufacturing problems (4) marketing and distribution.

PB84-200492/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Agricultural Machinery and Implements: Tanzania Case,
E. M. Ngaiza. 7 Mar 84, 30p UNIDO/ID/WG.418/7, V-84-82968

Keywords: *Agricultural machinery, *Tanzania, *Technology transfer, Manufacturing, Technology, Government policies, Marketing, Industrial development, Developing country application.

This report covers (1) information on the country (2) present state-of-art in relevant manufacturing and research activities (3) major problems of manufacturing and marketing (4) technology development and technology transfer (5) national technology policy; industrial development policy (6) cooperation among small scale industries in developing countries. Additional references: raw materials, manpower, transport, spare parts, joint ventures, demand, agricultural mechanization, TCDC.

PB84-201805/GAA PC **E07**/MF **E07**
Water Research Centre, Stevenage (England).
Effluent Recharge: The Effects of Effluent Recharge on Groundwater Quality.
Technical rept.,
K. M. Baxter, and L. Clark. c1984, 61p TR-199

Keywords: *Ground water, *Sewage disposal, *Water pollution, Ground water recharge, Aquifers, Hydrogeology, Management, Saturated soils, Hydraulics, Microbiology, Great Britain, Saturated flow.

Research, to assess the effects on groundwater quality of recharging sewage and sewage effluents to the major aquifers of the UK, has been undertaken by the Water Research Centre (WRC) at eight working sites over the seven years from 1975 to 1982. The work, partly funded by the Department of the Environment (DOE) and the Commission of the European Communities (CEC), was undertaken in response to a rising concern over the vulnerability to pollution of aquifers that are being used both for effluent recharge and for drinking water abstraction. The objectives of the research were: (1) To determine the effectiveness of the saturated and unsaturated zones in improving the quality of recharged effluent. (2) To determine the effects of effluent recharge on the aquifers. (3) To determine travel times within the UK aquifers. (4) To establish aquifer management guidelines. (Copyright (c) Water Research Centre, 1984.)

PB84-201912/GAA PC **E08**/MF **E08**
Water Research Centre, Stevenage (England).
Investigations of Sewage Discharges to Some British Coastal Waters. Chapter 3. Bacteriological Enumeration Procedures, Part 1.
Technical rept.,
G. Stanfield, and T. E. Irving. c1983, 93p TR-192
See also PB84-201904.

Keywords: *Sewage disposal, *Microbiology, *Coasts, *Great Britain, Coliform bacteria, Sampling, Outfall sewers, Feces, Streptococcus, Tests, Standards, Potable water, Counting methods, Comparison.

Contents:
- Description of original coliform method;
- Preparation of samples for analysis;
- Diluents and dilution;
- Membrane filters;
- Counting;
- Analysis for total coliforms using 3% Teepol;
- Improved coliform analysis procedure;
- Thermotolerant coliforms, Faecal Coliforms, and E. Coli;
- Evaluation of delayed-incubation membrane-filter tests for coliform analysis;
- Facile techniques;
- Faecal streptococci;
- Analysis for sulphite-reducers (Clostridia);
- Bifidobacteria.

PB84-202290/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Peru - Principales Cuestiones y Recommendaciones en Materia de Desarrollo (Peru: Major Development Policy Issues and Recommendations).
c1981, 236p
See also PB84-202282.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Peru, *Economic analysis, *Financial management, Economic conditions, Policies, Economic policies, Socioeconomic conditions, Financial stability, National economics, Economy.

The present report is based on the findings of a mission that took place during the transition from military to civilian and democratic rule in 1980. The dialogue with the new authorities at that time was particularly intensive since they were in the process of assessing the country's economic and social situation and of defining their approach to policy issues in various fields. At that time, the Peruvian economy was emerging from the severe 1977-78 economic crisis. Its external financial position had improved dramatically, and the economy experienced moderate growth in 1979 and 1980. In spite of this recovery, a large number of short-term and structural problems continued to plague the country; some problems such as skewed income distribution, nutrition, education, and health had become even more acute owing to the economic crisis. The present report focusses mainly on what the Bank perceived, at that juncture, as the most important development policy issues. It attempts to outline a strategy that would permit maintenance of financial stability, while at the same time effectively tackling the most crucial social and economic development problems. It also emphasizes the need for continuing stabilization efforts without which the development goals and aspirations of the Government and Peruvian society cannot be persistently pursued and achieved.

PB84-202548/GAA PC **A07**/MF **A01**
SumX Corp., Austin, TX.
Investigation of Photocatalytic Oxidation for Wastewater Cleanup and Reuse,
D. W. DeBerry, A. Viehbeck, G. R. Peyton, and M. Karpinski. 1983, 132p OWRT/RU-83/12, , OWRT-C-10029-R(1453)(1)
Contract DI-14-34-001-1453

Keywords: *Water pollution, Reaction kinetics, Organic compounds, Semiconductors, Solar energy, Industrial wastes, Electrochemistry, Chemical industry, Food industry, Petrochemistry, *Waste water reuse, Titanium dioxide.

This program investigated a new treatment process for removal of low concentrations of organic compounds from wastewaters. The treatment process uses light energy as the driving force for the photocatalytic oxidation of dissolved organic species on suspended semiconductor powders. Based on the results of a previous study, TiO2 was the semiconductor used in this program, which was designed to further characterize the process with respect to operating parameters and scope of applicability. Detailed kinetic analyses for the removal of a variety of organic compounds are presented. Factors such as light intensity, amount of semiconductor added, irradiated surface to volume ratio, light intensity, and amount of ionic constituents in the water were also investigated. Actual wastewater samples were obtained from several sources and used for process testing. The degree of effectiveness of the process was found to depend in part on the type of organic molecule being treated. Polar substances and compounds containing nitrogen or sulfur groups were much more susceptible to treatment than unsubstituted aromatics, mineral oils, or saturated hydrocarbons. The relative removal rates were not in direct relationship to the corresponding reaction rates with hydroxyl radicals, indicating that more is involved than hydroxyl radical production at the semiconductor powder surface. The main limiting rate factor for the systems studied was the low quantum efficiency found, coupled with the wide band gap of TiO2 which allows use of only a small fraction of the solar spectrum.

PB84-202779/GAA PC **A10**/MF **A01**
United Nations Industrial Development Organization, Vienna (Austria).
First World-Wide Study of the Wood and Wood Processing Industries.
Sectoral studies series no. 2.
3 Aug 83, 214p UNIDO/IS.396, V-83-59058

Keywords: *Wood products, Policies, *Forestry, Sawmills, Forest trees, *Natural resources, Area, Developing countries, Afforestation, Reforestation, Lumbering, Transportation, Construction, Manpower, Panels, Pile structures, Poles(Supports), International trade, Global, Developing country application.

Contents:
- The wood and wood processing sector in the world;
- Logging and transport;
- Possibilities and prerequisites for mechanical wood processing industries in developing countries;
- International trade in wood and wood products;
- Some policy related issues concerning the development of wood processing in developing countries;
- Marketing and product promotion;
- Conclusions regarding the development of primary and secondary wood processing industries and measures to promote the use of wood and wood products.

PB84-202787/GAA PC **A05**/MF **A01**
United Nations Industrial Development Organization, Vienna (Austria).
Guidelines for Software Development in Developing Countries,
R. Narasimhan. 10 Feb 84, 91p UNIDO/IS.439, V-84-81527
See also PB84-202795.

Keywords: *Computers, *Training, Policies, Personnel development, Strategy, Developing country application.

This report covers (1) software as technology and as engineering, (2) software produced in developing countries: historical background; structure of the industry; strategies, policies and trends, (3) software needs of the DCs, (4) promoting self help in software production, (5) issues in manpower development; required training, (6) initiatives needed; cooperation; the role of developing countries; the role of UNIDO and other UN agencies.

PB84-202795/GAA PC **A06**/MF **A01**
United Nations Industrial Development Organization, Vienna (Austria).
Guidelines for Software Production in Developing Countries,
H. Kopetz. 10 Feb 84, 109p UNIDO/IS.440, V-84-81528
See also PB84-202787.

Keywords: *Computers, Policies, Personnel development, Computer programming, Standards, Methodology, Structured programming, Developing country application.

This report covers (1) definition of 'software'; the role of software and hardware in the computer industry, (2) the need for self help and a software policy in DCs; organizational aspects, training centers, standards, (3) organizing a software project, (4) the software development process, (5) a standard operating system for microcomputers and (6) a methodology for structured systems analysis and functional systems design.

PB84-203728/GAA PC **E05**/MF **E05**
Centre de Documentation de l'Armement, Paris (France). Direction des Recherches, Etudes et Techniques.
Informatique (Informatics).
1983, 98p ISBN-2-7170-0738-5
Text in French.

Keywords: *Information systems, *Computers, Programming languages, Software, Interactive systems, Bubble memories, Computer architecture, Multiprocessers, Voice recognition.

An overview is provided of the French Ministry of Defense research program and interests in the field of Informatics. Topics include: Informatics and Defense, Computer Architectures (numerical simulation of complex systems, The vectorial computer projects ISIS, The multiprocessor project Marianne, Synchronous parallel processors, example of the utilization of a multiprocessor configuration, high reliability computers, signal processing computers, the calculateur Militaire Francais project); perpherials and memories (magnetic bubble memories, nonvolatile memories); software (software engineering, programming languages); applications (signal processing, image processing, voice recognition technologies for interactive command and control systems, computer-assisted translation of scientific information); numerical analysis (basic numeric methods, methods for the numeric simulation of continuous media).

PB84-204114/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Silicon Foundry to Service Developing Countries' Needs: A Preliminary Approach.
22 Feb 84, 14p UNIDO/IS.444, V-84-82125

Keywords: *Electronics, *Economic analysis, *Industrial development, Capitalized costs, Startup costs, *Foundries, Production costs, Developing country application.

This report presents an introductory approach towards developing a silicon foundry serving the needs of developing countries. The report covers (1) trends in microelectronics and the needs of developing countries (2) silicon foundry approach for DCs (3) investment estimates; capital costs and production costs and, (4) training programs.

PB84-204171/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Microelectronics Applications for Developing Countries: Preliminary Issues for Concerted Action.
1 Mar 84, 10p UNIDO-ID/WG.419/1, V-84-82640

Keywords: *Electronics, *Technology assessment, Information sciences, Silicon, Foundries, Socioeconomics, Developing country application, Information dissemination.

This report covers (1) actions and cooperation required to realize the potential of information technology for socio-economic development; opportunities for DCs and (2) the basic issues (a) information exchange on goals and activities (b) analysis of gaps, complementarities, and common ground (c) possible cooperation mechanisms (d) assembling a roster of experts and (e) silicon foundries for integrated circuits for joint use by DCs.

PB84-204387/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Software Engineering: A Survey,
W. M. Turski. 22 Feb 84, 22p UNIDO/IS.446, V-84-82124

Keywords: *Computers, Programming languages, Developing country application, Software tools.

This report covers (1) main directions; emphasis on software 'correctness' (2) specification-based methods of programming (3) approaches to specifications of software (4) software life-cycle; modular design; software modification; software tools (4) non-procedural languages and other advanced concepts in programming (5) software engineering management.

PB84-204528/GAA PC**$5.00**
Small Business Administration, Washington, DC.
State Activities in Venture Capital, Early-Stage Financing, and Secondary Markets.
Final rept.,
B. Hollis. May 84, 66p

Keywords: *Small businesses, *Financial management, Intergovernmental relationships.

The report examines equity programs, including public and private co-venture capital and early-stage financing activities. State secondary market developments for loans guaranteed by the Small Business Administration are also included in brief format. The purpose of the study is to describe the various efforts of states in providing some form of early stage financing or venture capital activity. Of primary emphasis are the states' equity or 'risk'-oriented programs.

PB84-204890/GAA PC **E04**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Safety Standards for the Erection and Maintenance of Electrical Installations,
G. P. Canevari. 7 Feb 84, 39p UNIDO-ID/WG.369/15, V-84-81338
Presented at Technical Course on Criteria for the Selection of Woodworking Machines, held at Milan, Italy, on 10-26 May 1982.

Keywords: *Occupational safety and health, *Electric power, *Woodworking, Developing country application, Industrial safety.

This report covers (1) preliminary considerations; proper functioning and safety; electrical hazards and relative protection (2) survey of developments in power supply parameters; standardization of distribution systems; safety requirements for each system (3) electrical connection criteria for machinery; machine maintenance and repair instructions.

PB84-204908/GAA PC **E05**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Biotechnology and the Developing Countries: Applications for the Pharmaceutical Industry and Agriculture.
12 Mar 84, 80p UNIDO/IS.452, V-84-83242

Keywords: *Industrial development, *Technology assessment, *Agriculture, *Drugs, Genetics, Proteins, *Vaccines, Antibiotics, Animal husbandry, Pest control, Pesticides, Immunization, Pharmaceutical industry, Developing country application, Genetic engineering, Animal health.

This report covers (1) definitions (2) pharmaceutical applications of biotechnology and genetic engineering (a) recombinant DNA: proteins, vaccines, antibiotics, immunization, etc. (b) new biotechnology and fermentation (3) biotechnology and agro-industry: livestock husbandry; animal health; genetic improvement of plants; pesticides; biological pest control agents (4) relevant projects. This report includes Tables, bibliography, lists of diseases.

PB84-204916/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Bioenergy from Farm Wastes and/or by Farm Wastes for Rural Development,
F. D. Maramba, Sr. 20 Feb 84, 12p UNIDO-ID/WG.418/4, V-84-82541
Presented at Technical Congress held in Conjuction with the Third International Fair - Technology for the People, Manila, Philippines, 23-25 November 1983.

Keywords: *Agricultural wastes, *Biomass, Fermentation, Coconuts, Rural areas, Fuels, Rice, *Biogas, Rice hulls, Alcohol fuels, Renewable energy sources, Manure, Developing country application, Biomass plantations.

UNIDO pub on production of biogas and other fuels from agricultural wastes - covers: biogas from manure; rice husks; energy plantation on wastelands; straight hydrous alcohol as substitute engine fuel; straight crude coconuts oil as substitute for diesel fuel. Additional references: technology transfer, appropriate technology, fermentation, renewable energy, composting, biomass.

PB84-204932/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Machines and Equipment for Tool Maintenance,
R. Ruzzenenti. 1 Mar 84, 20p UNIDO-ID/WG.369/14, V-84-82630
Presented at Technical Course on Criteria for the Selection of Woodworking Machines, held at Milan, Italy, on 10-26 May 1982.

Keywords: *Woodworking, *Machine tools, *Maintenance, Visual inspection, Cleaning agents, Sharpening, Grinding wheels, Grinding machines(Tools), Developing country application.

The report covers need for proper maintenance of tools and equipment; cleaning procedures, use of solvents and various liquids; inspection and control of tools; sharpening of saws and cutting tools; use of the grinding wheel; relevant machine tools; economic aspects of use.

PB84-204999/GAA PC **A02**/MF **A01**
United Nations Industrial Development Organization, Vienna (Austria).
Gas Producers Technology for Rural Applications,
I. E. Cruz. 29 Feb 84, 9p UNIDO-ID/WG.418/2, V-84-82539
Presented at Technical Congress held in Conjuction with the Third International Fair - Technology for the People, Manila, Philippines, on 23-25 November 1983.

Keywords: *Fuels, *Rural areas, Heating systems, Internal combustion engines, Furnaces, Crop driers, Technology, Rice hulls, Solid wastes, Liquid wastes, Developing country application.

UNIDO pub on producer gas applications in rural areas - covers (1) use of such gas which is produced by the incomplete combustion of carbonaceous and cellulose solid fuels (a) for direct heating as in furnaces and in crop drying (b) as engine fuel to provide shaft power (2) cooling and cleaning of producer gas in preparation for use as fuel for internal combustion engines (3) required equipment; chemical reactors; gasification systems.

PB84-205251/GAA PC **E06**/MF **E01**
National Swedish Inst. for Building Research, Gaevle.
Upgrading Reconsidered - The George Studies in Retrospect,
A. Schlyter. Apr 84, 119p MEDDELANDE/BULL-M84:4

Keywords: *Building materials, *Houses, Policies, Zambia, *Africa, *Latin America, Development, Urban planning, Poverty, Low income population.

In many countries upgrading policies of urban housing stock have been adopted to improve poor settlements. To understand the process whereby houses are built and settlements develop, empirical data from a longitudinal study of the former squatter settlement, George in Lusaka, Zambia, is brought up-to-date. The impact of an upgrading project on some individual households is discussed. As a background to a current debate between advocators and critics of upgrading policies a historical review of research on poor urban settlements is presented. The critics' condemnation of upgrading, derived from analyses of state intervention and production forms, are examined in the light of the George experiences. Many of the analytical tools of the critics are found to be useful, though insufficient, when analyzing domestic or unpaid work and qualitative aspects of housing.

PB84-205525/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Meeting on Energy Conservation in Small and Medium Industries, Held at Kuala Lumpur, Malaysia, on 1-2 December 1983.
17 Feb 84, 20p UNIDO/IS.443, V-84-81843

Keywords: *Energy management, *Industrial plants, *Energy conservation, Developing country application.

This paper contains synopses of discussions by industrial representatives on energy conservation methods currently used and subsequent results of the implementation of these methods.

PB84-205947/GAA PC **E03**/MF **E01**
United Nations Industrial Development Organization, Vienna (Austria).
Expert Group Meeting on Downstream Processing Activities in the Vegetable Oils and Fats Industry in Developing Countries, Held at Vienna, Austria, on 6-8 February 1984.
19 Mar 84, 15p UNIDO/PC.97, V-84-83487

Keywords: *Vegetable oils, *Food processing, Raw materials, *Technology transfer, Quality control, Packaging, Oilseeds, Fruits, Developing country application, Infrastructure, Energy requirements.

This report covers consideration of (1) raw materials supply; use of high yielding oilseeds and fruits (2) physical infrastructure and energy requirements (3) factory organization; use of by-products; quality control; packaging (4) technology transfer; cooperation between research centers, industry and higher education; nutritional aspects; training and management development.

PB84-206465/GAA PC **A08**/MF **A01**
Sverdrup and Parcel and Associates, Inc., St. Louis, MO.
Investigation of Textile Dyebath Reconstitution and Reuse. Volume 1. Technical Report.
Rept. for Apr 81-Dec 83 on Phase 3,
J. F. Bergenthal, and A. J. Tawa. May 84, 155p EPA-600/2-84-100A
Contract EPA-68-02-3678
See also PB84-206473.

Keywords: *Textile industry, *Water pollution, Industrial waste treatment, Recirculation, Cost analysis, Feasibility, Economic analysis, Capitalized costs, Sewers, Carpets, *Waste water reuse, Pretreatment(Water), Publicly owned waste water treatment.

The two-volume report gives results of a detailed examination of dyebath reconstitution and reuse, one of several wastewater recycle/reuse technologies allowing textile finishing mills to reduce the volume of wastewater and the amount of pollutants discharged. (NOTE: About 80% of these plants discharge their wastewater to publicly owned treatment works (POTWs). Most of the wastewater receives little or no pretreatment before discharge into municipal collection systems.) This recycle technology is considered promising for several reasons: significant environmental benefits, potential for widespread application, low capital cost, cost savings in textile dyeing, and economic attractiveness. Volume 1 gives results of the investigation at a carpet mill. It gives results of bench-, pilot-, and full-scale testing, presenting wastewater data documenting the achieved pollutant reductions. It addresses the economic feasibility of implementing the technology full-scale.

PB84-206473/GAA PC **A08**/MF **A01**
Sverdrup and Parcel and Associates, Inc., St. Louis, MO.
Investigation of Textile Dyebath Reconstitution and Reuse. Volume 2. Operations Manual.
Rept. for Apr 81-Dec 83 on Phase 3,
J. F. Bergenthal, and A. J. Tawa. May 84, 175p EPA-600/2-84-100B
Contract EPA-68-02-3678
See also PB84-206465.

Keywords: *Water pollution, *Textile industry, Industrial waste treatment, Recirculation, Cost analysis, Feasibility, Economic analysis, Operating, Computer programs, Laboratory equipment, Pilot plants, Assessments, *Waste water reuse, Pretreatment(Water), Publicly owned wastewater treatment.

The two-volume report gives results of a detailed examination of dyebath reconstitution and reuse, one of several wastewater recycle/reuse technologies allowing textile finishing mills to reduce the volume of wastewater and the amount of pollutants discharged. (NOTE: About 80% of these plants discharge their wastewater to publicly owned treatment works (POTWs). Most of the wastewater receives little or no pretreatment before discharge into municipal collection systems.) This recycle technology is considered promising for several reasons: significant environmental benefits, potential for widespread application, low capital cost, cost savings in textile dyeing, and economic attractiveness. Volume 2 gives detailed procedures and methods for implementing the technology, serving as an operations manual for other mills wishing to investigate the technology.

PB84-206481/GAA PC **A06**/MF **A01**
Texas Southern Univ., Houston.
Project to Increase the Level of Patronage for Public Transit Among Specialized Groups. Phase 1.
Final rept. Sep 82-Aug 83,
N. W. Lede, and L. C. Cooper. Mar 84, 115p UMTA-TX-11-0014-84-2
Contract DOT-UMTA-TX-11-0014
See also PB84-197979.Portions of this document are not fully legible.

Keywords: *Transportation management, Promoting, Marketing, Elderly persons, Handicapped persons.

This project focuses on transit management as it relates to marketing to the transportation disadvantaged. It is designed to stimulate ridership and to improve the image of public transit generally through a marketing program tailored to the needs of special users.

PB84-207240/GAA PC **A02**/MF **A01**
Center for Energy and Environment Research, Mayaguez, PR.
Tropical Window Solar Water Heater,
J. T. Pytlinski. Dec 83, 8p CEER-S-179
Presented at the World Energy Engineering Congress (6th), November 29-December 2, 1983, Atlanta, Georgia.

Keywords: *Solar energy, *Buildings, Costs, *Solar water heating, Energy conservation, Developing country application, Energy costs.

A conceptual breakthrough in solar water heating in the form of a tropical window solar water heater is described. A louvered window that is mass produced and commonly used in Puerto Rico and the Caribbean is employed as a solar collector by replacing louvers with solar radiation absorbing surfaces. The copper thermafin absorbers act as louvers and as solar heat collectors. The window functions as a normal window while operating as a solar collector-water heater. The cost of the tropical window solar collector is in the range of $75/sq. m. whereas the cost of a flat-plate solar collector is about $215/sq. m. Because of its technical simplicity and low cost, this novel system has the potential to be manufactured and commercialized in the Caribbean, Latin America, Asia, and the Near East. A detailed description of the system construction and operation is provided and illustrated by photographs and schematics. Various ways in which the tropical window solar water heating system can be incorporated into water heating installations already marketable are mentioned. And, other advantages of the system related to energy conservation and security are briefly discussed. The research installation used to evaluate the thermal performance of the tropical window solar water heater is described, and some details about the measuring procedure are given. Finally, the research program being conducted is presented, and the preliminary results of the thermal performance of a single tropical window used as a solar water heater are discussed.

PB84-207281/GAA PC **A02**/MF **A01**
Center for Energy and Environment Research, Mayaguez, PR.
Variable Geometry Darrieus Wind Machine,
J. T. Pytlinski, and D. Serrano. Aug 83, 15p CEER-S-178
Sponsored in part by Department of Energy, Washington, DC. Presented at the 1983 Solar World Congress, 14-19 August 1983, Perth, Western Australia.

Keywords: *Turbines, *Wind energy, *Wind pressure, Computer simulations, Developing country application.

A new variable geometry Darrieus wind machine is proposed. The lower attachment of the blades to the rotor can move freely up and down the axle allowing the blades to change shape during rotation. Experimental data for a 17 m. diameter Darrieus rotor and a theoretical model for multiple streamtube performance prediction were used to develop a computer simulation program for studying parameters that affect the machine's performance. New structural and dynamic parameters were incorporated into the program and varied in order to simulate the machine's operation in a wide range of aerodynamic conditions. In computations a parabolic blade was used to approximate a true troposkein shape. This new variable geometry concept is described and interrelated with multiple streamtube theory through aerodynamic parameters. The computer simulation study shows that governor behavior of a Darrieus turbine can not be attained by a standard turbine operating within normally occurring rotational velocity limits. These results are illustrated graphically and numerically. A second generation variable geometry Darrieus wind turbine which uses a telescopic blade is proposed as a potential improvement on the studied concept.

PB84-207299/GAA PC **A03**/MF **A01**
Puerto Rico Univ., Mayaguez.
Tecnicas de Ensenanza (Teaching Techniques),
M. L. C. Thillet. Jun 81, 43p
Text in Spanish.

Keywords: *Education, *Agriculture, Rural areas, Populations, Selection, Mass communication, Publicity, Developing country application.

This booklet is primarily for agricultural extension workers and covers various methods for teaching new farming techniques to the rural population. It covers discussion groups (factors contributing to the success of a discussion, how to organize the group, types of discussion groups), study circles, panels (selection of panel members, function of the moderator), the forum, symposia, sociodramas (types, how to organize it, periods of general discussion, steps to follow - define the problem, determine what the situation is, choose the characters, instruct and motivate, analyze the action, and summarize and apply what is learned), radio call-in shows, film fora, debates, site visits, demonstrations of results (steps to follow), and demonstrations of methods.

PB84-207307/GAA PC **A03**/MF **A01**
Puerto Rico Univ., Mayaguez.
Ahorre Energia en su Hogar (Conserving Energy in Your Home),
I. A. de Colon. Mar 83, 45p
Text in Spanish. Errata sheet inserted.

Keywords: *Electric power, *Energy management, *Financial management, Electric power generation, *Energy conservation, Developing country application.

This pamphlet provides a list of practical and cost free steps you can take to conserve energy. Appendices explain how to select, buy and, use household appliances and equipment; and how to prepare a monthly budget for the consumption of electricity.

PB84-207398/GAA PC **A04**/MF **A01**
Puerto Rico Univ., Mayaguez.
Aplique los Plaguididas Correctamente: Guia para Agricultores Usuarios de Plaguicidas Restringidos (Correct Application of Pesticides: Guide for Agricultural Users of Restricted Pesticides),
M. C. Ferrer, M. G. Flores, H. Cibes, C. Mantaras, and N. Ayala. 1984, 60p
Text in Spanish.

Keywords: *Pesticides, *Pest control, *Puerto Rico, Damage, *Safety, Personnel, Environments, Sprayers, Equipment, Spray nozzles, Insects, Plants(Botany), Recommendations, Liquids, Solids, Developing country application.

This guide was written to help farmers comply with U.S. federal and Puerto Rican laws on the application of pesticides, but it doesn't include all the necessary information to identify pests. The guide does cover: some characteristics of the most common pests, how they develop, and the different damages they cause; methods you can use to control the pests; how the pesticides work; how labels can be useful; how to use pesticides without injuring yourself or damaging the environment; and how to choose, use, and maintain certain equipment for applying pesticides.

PB84-207414/GAA PC **A02**/MF **A01**
Puerto Rico Univ., Mayaguez.
Origen y Effectos de la Contaminacion del Aire (Origin and Effects of Air Pollution),
J. I. Anglero. Sep 80, 13p
Text in Spanish.

Keywords: *Air pollution, *Health, Particles, Sulfur dioxide, Carbon monoxide, Hydrocarbons, Ozone, Lead(Metal), Developing country application.

This pamphlet is a general introduction to air pollution for the general public. It covers particulates, sulfur dioxide, nitrogen dioxide, carbon monoxide, hydrocarbons, ozone, and lead.

PB84-207422/GAA PC **A03**/MF **A01**
Puerto Rico Univ., Mayaguez.
Ganado Lechero. Primera Parte: La Crianza de la Becerra (Milch Cattle. Part 1: Nursing and the Yearling),
J. M. L. Acosta, and B. S. Herrero. Jul 81, 27p
Text in Spanish.

Keywords: *Livestock, *Animal husbandry, Dairy cattle, Selection, Feeding(Supplying), Animal diseases, Growth, Developing country application, Associations, Listings.

This pamphlet covers cattle terminology, required activities for the first and second year, breeds of milk cattle, breed associations, selection of the breed, feeding the yearling, teaching it to drink, dehorning, health, and growth.

PB84-207448/GAA PC **A05**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Limits on Common Pasture Use in an Agro-Pastoral Community: The Case of Toqra, Peru,
K. A. Jamtgaard, and L. Jimenez-Zamalloa. Apr 84, 92p TRS-42
Grant AID/DSAN/XII-G-0049
Prepared in cooperation with Missouri Univ.-Columbia. Dept. of Rural Sociology.

Keywords: *Farming, *Agriculture, *Land use, *Livestock, *Peru, Competition, Grazing land, Manpower, Ruminants, Sheep, Manure, Accumulation, Farms, Developing country application, Cuesco(Peru).

One of the major issues concerning development activities among groups of traditional livestock producers is that of common pastures and the overgrazing that is often associated with this type of land tenure. Worries about competitive behavior among pastoralists regarding communally held pastures have preoccupied development experts for some time. This report looks at one agropastoral community near Cusco, Peru, and focuses on how the community's pasture resources were used.

PB84-207497/GAA PC **A03**/MF **A01**
Center for Energy and Environment Research, San Juan, PR.
Status of Renewable Energy Programs in Caribbean Islands,
J. A. Bonnet, Jr., and W. C. Koehler, Jr. May 84, 27p CEER-X-182
Grant NSF-INT83-02757
Presented at Energex 84 Meeting, Regina, Saskatchewan, Canada, May 1984.

Keywords: *Caribbean, *Renewable energy, Caribbean Islands, Research management, Developing country application.

The Caribbean is a complex region of different peoples, cultures, economies, and resource bases. With the exception of one, all are dependent almost entirely on imported oil to meet their energy needs. Yet there are significant opportunities to develop their renewable energy resources. Research, development, demonstration, and to some extent distribution of renewable energy systems have begun. These range from research into OTEC, solar ponds, windmills, and solar cooling. In part the impetus to develop these systems comes from assistance from outside the Caribbean. Indigenous competencies are increasing, however. In recent years the level of effort has increased significantly, to the extent that renewable energy programs exist throughout the region.

PB84-208909/GAA PC **A04**/MF **A01**
Aquatic Farms Ltd., Kaneohe, HI.
Cage Culture of Red Tilapia in Prawn and Shrimp Ponds.
Final rept. on Phase 1.
Mar 82, 56p NSF/OCE-82002
Grant NSF-OCE81-13719

Keywords: *Aquaculture, *Ponds, Food habits, Survival, Mortality, Fresh water, Water temperature, Diets, Brackish water, Growth.

Results are presented of feeding trials conducted in prawn ponds (freshwater) and shrimp ponds (brackishwater) with red tilapia stocked in floating cages. Seven ponds were stocked at a density of 26 cages per hectare. One-hundred nine-gram tilapia were stocked into each cage. Fish survival after eight weeks averaged 98.5%, excluding a set of six cages from one pond which were preempted from the study because of high mortality. The growth of tilapia fed supplemental diets was significantly higher in brackishwater than in freshwater ponds. It is concluded that these greater growth rates are due to a greater availability of natural food organisms.

PB84-209014/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Meeting the Needs of the Poor for Water Supply and Waste Disposal,
F. L. Golladay. c1983, 66p ISBN-0-8213-0238-8
See also Spanish version, PB84-209022, French version, PB84-209030, and Hebrew version, PB84-209048. Library of Congress catalog card no. 83-14636.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Water supply, *Waste disposal, Communities, Community development, Cooperation, Government policies, Financing, Developing countries.

This paper examines economic, political, social and cultural obstacles to meeting the needs of low-income people for water supply and waste disposal and it proposes steps to reduce these obstacles. Households are often poorly informed about available options and are unable to allocate resources efficiently among their members. The paper suggests ways in which communications, peer and family support for innovators and incentives can be strengthened. Communities organize and manage resources in order to carry out activities that cannot be profitably undertaken by households, encourage constructive change and sanction undesirable behavior. The paper proposes methods for facilitating the formation and operation of community organizations to carry out these functions. Formal bureaucracies provide professionalized technical and administrative services, and supply policy guidance, goods and financial resources to operating agencies and communities. Largely because of their inherent conservatism, formal bureaucracies often fail to satisfy these needs, especially for innovative activities. Governments must revise legal codes to permit adoption of affordable technologies, and must assist community organizations in dealing with legal, financial, technical and administrative problems and in recruiting and retaining competent technical staff. These demands must be met within the constraints of both practical politics and bureaucratic behavior.

PB84-209238/GAA PC **A13**/MF **A01**
Transportation Systems Center, Cambridge, MA.
Planning for Downtown Circulation Systems. Volume 1. Planning Concepts.
Final rept. Jun 77-Dec 81.
Oct 83, 294p* DOT-TSC-UMTA-83-47-1, UMTA-MA-06-0039-83-2
See also Volume 2, PB84-209246. Prepared in cooperation with Peat, Marwick, Mitchell and Co., Washington, DC., Cambridge Systematics, Inc., MA., and Regional Plan Association, Inc., New York.
Also available in set of 3 reports PC E99, PB84-209220.

Keywords: *Urban planning, *Transportation management, *Traffic engineering, State of the art, Public transportation, Guideway transportation.

This document brings together the state-of-the-art in planning concepts, methods and data for use by those cities proposing or considering comprehensive or innovative downtown circulation systems, particularly Downtown People Mover systems. DPM systems are a subset of Automated Guideway Transit (AGT) systems, a class of transportation systems that includes unmanned vehicles operating on fixed exclusive guideways. Although primary attention in the report is given to DPM systems, it should be emphasized that these are but one example of a downtown circulator system. The advantage of using such a complicated circulator system example as a DPM is that the resulting report covers a broad range of planning issues, only a subset of which would be of cocern in planning a simpler or conventional circulation system. The report thus tends to be a quite useful reference document for planning any type of downtown circulation system. This volumes comprises the concept stage of the downtown circulator planning process. Included are sections on the development of goals and objectives, generation of alternative conceptual designs, familiarization with important planning issues, and crude feasibility studies of alternative systems.

PB84-209246/GAA PC **A11**/MF **A01**
Transportation Systems Center, Cambridge, MA.
Planning for Downtown Circulation Systems. Volume 2. Analysis Techniques.
Final rept. Jun 77-Dec 81.
Oct 83, 228p* DOT-TSC-UMTA-83-47-2, UMTA-MA-06-0039-83-3
See also Volume 1, PB84-209238, and Volume 3, PB84-209253. Prepared in cooperation with Peat, Marwick, litchell and Co., Washington, DC., Cambridge Systematics, Inc., MA., and Regional Plan Association, Inc., New York.
Also available in set of 3 reports PC E99, PB84-209220.

Keywords: *Urban planning, *Transportation management, *Traffic engineering, State of the art, Public transportation, Guideway transportation.

This volume contains the analysis and refinement stages of downtown circulator planning. Included are sections on methods for estimating patronage, costs, revenues, and impacts, and a section on methods for performing micro-level analyses.

PB84-209253/GAA PC **A11**/MF **A01**
Transportation Systems Center, Cambridge, MA.
Planning for Downtown Circulation Systems. Volume 3. Appendices.
Final rept. Jun 77-Dec 81.
Oct 83, 226p* DOT-TSC-UMTA-83-47-3, UMTA-MA-06-0039-83-4
See also Volume 2, PB84-209246. Prepared in cooperation with Peat, Marwick, Mitchell and Co., Washington, DC., Cambridge Systematics, Inc., MA., and Regional Plan Association, Inc., New York.
Also available in set of 3 reports PC E99, PB84-209220.

Keywords: *Urban planning, *Transportation management, *Traffic engineering, State of the art, Public transportation, Guideway transportation, Travel demand models, Case studies.

This volume contains worksheets for estimating circulator patronage, costs, revenues and travel impacts, detailed discussions of estimation and application procedures for the demand models developed, and a case study of the models' application using a Los Angeles downtown people mover example.

PB84-211085/GAA PC **A06**/MF **A01**
Washington Univ., Seattle. Urban Transportation Program.
Planning, Designing and Operating Multi-Center Timed-Transfer Transit Systems: Guidelines from Recent Experience in Six Cities.
Final rept. 1 Jul 81-31 May 83,
J. B. Schneider, R. Deardorf, C. Deffebach, J. Latteman, and E. McCormack. Sep 83, 121p RR-83-1, UMTA-WA-11-0009-84-1
Contract UMTA-WA-11-0009
See also PB81-154569.

Keywords: *Urban planning, *Transportation management, Passenger terminals, Urban areas, Canada, Brazil, Evaluation, United States, Facilities, Operations, Australia, Rail transportation, Highway transportation, Intermodal transportation systems.

The planning, design and operation of a polycentric timed-transfer transit system in two American, two Canadian, one Australian and one Brazilian city is described and evaluated. The foreign systems have been in operation longer and are more fully developed than the American systems in Portland, Oregon and Tacoma, Washington. The experience gained in each of the six cities is described in terms of the location and sizing of the transit centers, the design of the physical facilities involved, route/schedule considerations and some data on operating experience gained to date. This report should be helpful to those American cities, particularly those located in the West, that wish to undertake the development of a polycentric timed-transfer bus/rail transit system that will fit well the diverse travel pattern generated by the modern polycentric city. The experience gained in each city is described in some detail and guidelines that should be helpful in other cities are highlighted.

PB84-212067/GAA PC **A06**/MF **A01**
Futures Group, Inc., Glastonbury, CT.
Characterization of Innovations Introduced on the U.S. Market in 1982.
Final rept.,
K. L. Edwards. Mar 84, 124p*
Contract SBA-6050-OA-82

Keywords: *Economic analysis, Policies, Statistical analysis, *Small businesses.

The purpose of the study was to examine the relationship between the innovation process and firm size and thereby to facilitate the development of policy designed to stimulate innovation. The innovations by firm size were compared to industry employment by firm size, using a special tabulation of the 1977 economic cenuses for the Small Business Administration. The comparison of 1977 employment with 1982 innovations corresponds to the average period between invention and innovation.

PB84-212406/GAA PC **A09**/MF **A01**
Romicon, Inc., Woburn, MA.
Evaluation of Hollow Fiber Ultrafiltration as a Pretreatment for Reverse Osmosis Desalination of Seawater.
Completion rept. 1 Apr 79-30 Sep 80,
B. R. Breslau, A. J. Testa, and B. M. Kilcullen. 1984, 176p OWRT-C-80309-S(8558)(1)
Contract DI-14-34-0001-8558

Keywords: *Desalination, Cleaning agents, Performance evaluations, Economic analysis, Graphs(Charts), Design criteria, Wrightsville Beach Desalination Plant.

An intensive study was conducted at the Wrightsville Beach Test Facility to evaluate the performance of hollow fiber ultrafiltration membranes as a pretreatment for seawater desalination via reverse osmosis. Several polymer types were evaluated to determine the best ultrafiltration membrane. In addition, two different fiber diameters (20 and 43 mil) were studied to investigate the effects of flow through the hollow fiber cartridge on flux, cleaning, and membrane life. The results from these tests show that the polysulfone PM-50 membrane (50,000 M.W. cutoff) which has a 43 mil internal diameter is well suited for seawater pretreatment. Various cleaning chemicals (sodium hydroxide, sodium hypochlorite, citric acid, surfactant types, etc.) were evaluated in several combinations of operating modes (reverse flow, backflush) to optimize the membrane performance. Economic analyses show that the three inch diameter, 26.5 square foot PM-50 hollow fiber cartridge can pretreat seawater at a cost of approximately one dollar per thousand gallons of seawater produced using a totally automated system.

PB84-214170/GAA PC **A03**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
Crop Output Growth: Changes in Component Contributions for Six Developing Countries.
Staff rept.,
D. Feinstein. Jun 84, 46p AGES-840419

Keywords: *Crops, *Farming, *Agricultural economics, Economic factors, Latin America, Asia, Production, Yield, Market value, Grains(Food), Farms, Area, Developing countries, Output, Statistical analysis, Trends.

Using a components-of-growth approach, this study analyzes factors affecting declining long-term rates of agricultural growth in selected countries of Latin America and Asia. In both regions, the contribution of expanding agricultural land area to crop output growth has significantly declined and the contribution of yield increase has been marginal. However, the relative importance of changes in the cropping pattern has increased moderately over the long term. Prospects for production growth will depend upon the development and adoption of yield-enhancing innovations in Latin America, and a shift to higher value cereals in Asia.

PB84-214295/GAA PC **E03**/MF **E01**
Helsinki Univ. of Technology, Espoo (Finland). Dept. of Technical Physics.
Improved Wrede Stand-Alone ORC (Organic Rankine-Cycle) Solar Water Pump with Tracking Concentrators,
P. D. Lund, and T. C. W. Wrede. 18 Apr 84, 24p
TKK-F-A543, ISBN-951-753-228-8

Keywords: *Solar water pumps, *Solar energy, Rankine cycle, Structural design, Automatic tracking, Cost effectiveness, Energy conversion heat sources, *Water pumps.

This paper describes the Wrede organic Rankine-cycle solar water pump employing tracking parabolic troughs. System principles and improvements introduced with the fifth-generation pump-unit and the concentrators are briefly discussed. Previous field tests with older versions of the solar water pump have shown an overall system efficiency up to 0.84 per cent (from solar input to water output), and the improved new version is expected to yield 1.2 per cent. Field tests have been commenced to verify the expected performance.

PB84-214790/GAA PC **E03**/MF **E03**
Commission of the European Communities, Luxembourg.
Biomethanization Plant in Baillonville,
B. Lemal, and B. Binet. c1983, 43p EUR-8547-EN/FR, ISBN-92-825-3865-6
Text in English, illustrations in French.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Keywords: *Biomass, *Methane, *Farming, Performance evaluation, Digesters, Fertilizers, Fuels, Anaerobic processes, Cost analysis, *Biogas, Manure.

The subject of this report is the biomethanization installation situated on a small poultry farm near Marche (Belgium). The poultry manure occupies the lower half of the cylinder and the biogas produced by anaerobic biological digestion is stored in the upper part. The report describes the performance of this installation over a period of 20 months, during which the digester produced approximately 230 gigajoules in the form of biogas. The global energy yield of the installation is greater than 60%. If the authors deduct from the overall cost of the project those amounts connected with the prototype character of the installation, break-even point can be achieved for this type of small digester, which is not only a significant source of energy, but also has the advantage of producing a deodorized organic fertilizer.

PB84-214840/GAA PC **E08**/MF **E08**
Commission of the European Communities, Luxembourg.
Solar Water Heating: An Analysis of Design and Performance Data from 28 Systems,
D. Turrent, R. Godoy, and R. Ferraro. c1983, 197p
EUR-8003-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Keywords: Solar heating, Performance, Trends, Systems, Operations, Design, *Solar water heating, Heat storage.

There are now more than 200,000 solar water heating systems installed and working in Europe. However, until recently, very little has been known about the performance of these systems, since few of them have been monitored. In this report, a compilation of the performance results obtained from 28 monitored systems within the European Community is presented for the first time. By pooling information together in this way it is possible to identify common trends in system performance, and to present some of the knowledge now gained about the operational characteristics of solar water heating systems. By this means, better systems may be designed in the future. Topics covered include climate; building types; solar collectors; heat storage; technical factors; monthly performance; annual performance; and system costs.

PB84-214923/GAA PC **E05**/MF **E05**
Commission of the European Communities, Luxembourg.
Experimentation de Micro-Irrigation par Pompage Solaire, 1979-1981 (Experments in Micro-Irrigation by Solar Pumping, 1979-1981),
X. Preel. c1983, 85p EUR-8571-FR
Text in French.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

Keywords: *Crops, *Irrigation, *Solar energy, Pumps, Panels, Feasibility, France, Developing countries, *Solar water pumps.

An experiment in the micro-irrigation of crops by sprinklers supplied by solar panel powered pumps was carried out in Bourriot-Bergonce, Landes, France. A detailed description is given of the project, its progress and economics, which over-all were satisfactory. An evaluation of the use of solar panels in irrigation installations in France and in developing countries showed the feasibility of such projects. (Copyright (c) CECA-CEE-CEEA, Bruxelles-Luxembourg 1983.)

PB84-215714/GAA PC **A03**/MF **A01**
National Research Council, Washington, DC.
Winged Bean: A High-Protein Crop for the Tropics. (Second Edition),
S. K. Karikari, T. N. Khan, K. O. Rachie, and R. E. Schultes. 1981, 30p AID-PN-AAJ-980
Contract AID/ta-C-1433, Grant AID-DAN-55-38-G-00-1023-00

Keywords: *Soybeans, *Nutrition, *Tropical regions, *Proteins, Oils, Vitamins, Amino acids, Comparison, Soybeans, Rainfall, Soils, Climate, Thailand, Nitrogen fixation, Developing country application, Psophocarpus tetragonolobus, Winged bean.

A 1975 report on the nutritional merits of the winged bean, Psophocarpus tetragonolobus, encouraged the crop's spread from Papua New Guinea and South East Asia to over 70 countries in the hope that it could become a major plant protein source for the tropics, as soybean is in temperate zones. This paper updates the 1975 report and details winged bean's agronomy, food use, and nutritive value. This 'supermarket on a stalk' provides six different foods (leaves, pods, seeds, tubers, flowers, and shoots) while duplicating soybeans nutritionally in regard to their protein, oil, mineral, vitamin, and essential amino acid content. Winged beans thrive in hot humid areas with 2,500 mm or more of annual rainfall, yet some variants are drought resistant and have proven resilient in different climates and soils. In Thailand, as many as 1,000 nitrogen-fixing root nodules have been found on a single plant, demonstrating that exceptional ability to fix nitrogen which results in the plant's high protein content.

PB84-217330/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Thailand: Rural Growth and Employment.
c1983, 212p ISBN-0-8213-0203-5
Library of Congress catalog card no. 83-6785.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Thailand, *Economic development, Developing countries, Rural areas, Employment, Policies, Agriculture, Demand(Economics), Manufacturing, Income.

The present study has been undertaken to establish: (a) the factors explaining the growth in rural nonfarm employment and its dependence on agricultural growth; and (b) the benefits that poor rural areas derive from rural nonfarm employment and measures, if any, that can be taken to accelerate its growth as a means to alleviate rural poverty. (Copyright (c) 1983 The International Bank for Reconstruction and Development/The World Bank.)

PB84-217348/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Common Agricultural Policy of the European Community: A Blessing or a Curse for Developing Countries.
World Bank staff working paper,
U. Koester, and M. D. Bale. c1984, 66p WP-630, ISBN-0-8213-0327-9
Library of Congress catalog card no. 84-2219.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *International trade, *Agricultural economics, Exports, Policies, Competition, Developing countries, Commodities, Abundance, Cost effectiveness, Surpluses, Global.

The European Community is the major player in global agricultural trade. Not only is it the leading importer of agricultural goods, it is also the dominant exporter of a number of agricultural products. Further, its export dominance is growing over time. It is, therefore, imperative that policymakers in developing countries and those that advise them on agricultural matters understand the implications of the EC's common agricultural policy on them. There are two major types of effects. On the one hand, as exporters of agricultural products, developing countries may lose their EC market share as the level of self-sufficiency of the EC increases or they may lose market share in third markets in competition with subsidized EC exports. On the other hand, as importers of certain agricultural products, some developing countries may gain by buying agricultural goods on the international market that are made cheaper and more abundant by EC agricultural surpluses. This paper spells out which commodities fit into each category in addition to explaining how the common Agriculture Policy operates. (Copyright (c) 1984 The International Bank for Reconstruction and Development/The World Bank.)

PB84-217371/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Trends in International Trade in Manufactured Goods and Structural Change in the Industrial Countries.
World Bank staff working paper,
B. Balassa. c1984, 45p WP-611, ISBN-0-8213-0251-5
Library of Congress catalog card no. 83-25996. Abstracts in French and Spanish.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *International trade, Markets, Resources, World market, Raw materials, Industrial production.

This paper follows the author's 'Structural Change in Trade in Manufactured Goods between Industrial and Developing Countries,' World Bank Staff Working Paper No. 396, June 1980. It extends the period of observation until 1981 and also provides estimates on the importance of trade with the developing countries for domestic production and consumption in the industrial countries in 1973. The results show the increasing importance of the developing countries as markets and sources of supply for the industrial countries. In 1973-78, the developing countries provided 8.5 percent, and in 1978-81 11.3 percent, of the increment in manufacturing production in the industrial countries while supplying 2.4 percent of the increment in their manufacturing consumption in 1973-78 and 3.8 percent in 1978-81. Both groups of countries benefited from this trade and further gains could be obtained through multilateral trade liberalization.

PB84-217447/GAA PC **A07**/MF **A01**
National Bureau of Standards (NEL), Washington, DC. Center for Building Technology.
Test Methods and Standards Development for Active Solar Heating and Cooling Systems.
Final rept.,
H. R. Trechsel, and B. L. Collins. Apr 84, 145p*
NBSIR-84-2845
Contract DE-AI01-76PR06010

Keywords: Tests, Standards, Heat storage, Materials, Residential buildings, Solar collectors, *Solar water heating, Solar absorbers.

Since test methods and standards for active solar heating and cooling systems did not exist in 1976, the Department of Energy sponsored research at the National Bureau of Standards (NBS) and other laboratories to aid in the development of research-based standards. This research was intended to facilitate a sound data base for the development of national consensus standards and test methods. In the present report, research by NBS and other laboratories is described for solar domestic hot water systems, solar collectors, thermal storage devices and collector materials. For collectors, the report describes research and test methods for determining the performance of cover plates, absorber materials, collector insulation, gaskets and sealants, rubber hose, containment materials, and heat transfer fluids.

PB84-217611/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Case Studies on Industrial Processing of Primary Products. Volume 1. Bauxite, Rubber, Tropical Hardwood.
c1983, 377p ISBN-0-8213-0154-3
See also PB84-134899. Library of Congress card no 83-1200.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Bauxite, *Industrial plants, *Rubber, *Wood, Processing, Cost analysis, Production, Commerce, Manpower, Rubber industry, Hardwoods, Wooden logs, Exports, Prices, Tables(Data), Case studies.

The purpose of this study was (1) to look at the locational determinants of bauxite processing, namely, alumina refining and primary aluminum smelting; (2) to assess the gains and losses from bauxite processing; and (3) on the basis of these analyses, to examine the policy options that would promote bauxite processing in resource-endowed developing countries. The processing chain examined here covers bauxite mining, alumina refining and primary aluminum smelting. Aluminum fabrication and secondary aluminum smelting are not treated as a major part of the study, and hereafter aluminum smelting means primary aluminum smelting, unless otherwise stated. Unlike the processing of the other (mainly tropical) products dealt with in this research project, bauxite processing in developing countries presents at least two unique complexities.

PB84-217645/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Decentralization in Developing Countries: A Review of Recent Experience.
World Bank staff working paper,
D. A. Rondinelli, J. R. Nellis, and G. S. Cheema.
c1984, 110p WP-581, ISBN-0-8213-0235-3
Library of Congress catalog card no. 83-14712. Also pub. as International Bank for Reconstruction and Development, Washington, DC. rept. no. MANAGEMENT AND DEVELOPMENT SER-8.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Socioeconomic status *Urban planning, *Regional planning, *Economic analysis, Social factors.

A large number of governments in developing countries have attempted to decentralize development planning and management responsibilities during the past decade. Decentralization has taken a number of forms--deconcentration of functions within the central bureaucracy, delegation of semiautonomous or quasi-public corporations, devolution to local governments, and the transfer of functions to nongovernment organizations. The results have been mixed. In some countries decentralization has resulted in greater participation in development activities, more effective and efficient administration of local and rural development programs, and expanded administrative capacity outside of the national capital. But in nearly all countries where governments have attempted to decentralize, they have faced serious problems of implementation. Some problems arose from insuffcent central political and bureaucratic support and others from ingrained centrist attitudes and behavior on the part of political and administrative leaders. In some countries, decentralization policies and programs were inappropriately designed, organized, and carried out. Nearly everywhere it was tried, decentralization was weakened by the failure to transfer sufficient financial resources to those organizations to which responsibilities were shifted.

PB84-217686/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Rural Water Supply Handpumps Project: Laboratory Testing, Fields Trials and Technological Development; UNDP GLO/79/010, INT/81/026.
c1982, 137p
Prepared in cooperation with United Nations Development Programme.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Water pumps, *Rural areas, *Water supply, Performance evaluation, Product inspection, Defects(Materials), Assessments, Manufacturing, Leakage, Safety, Hazards, Statistical analysis.

More than seventy five percent of over two billion people in the developing countries do not have access to adequate water supply and sanitation facilities. The more than 1500 million people who lack these basic services include 1200 million in the rural areas. The importance of providing safe water to these people has been repeatedly stressed by national governments and international agencies. The aim of the test is to examine a wide range of handpumps to assist in the selection of pumps for further field trials and at the same time to provide information to all interested manufacturers to assist them in the production of more efficient and more reliable pumps. Tests are conducted on two randomly selected samples of pumps, to provide information on basic features rather than on the quality of total production.

PB84-217694/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Energy Efficiency and Fuel Substitution in the Cement Industry with Emphasis on Developing Countries.
Technical paper,
M. H. Fog, and K. L. Nadkarni. c1983, 94p ISBN-0-8213-0270-1
Summaries in French and Spanish. Library of Congress catalog card no. 83-23279.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Cement, *Industrial plants, Cost analysis, Capitalized costs, Fuel consumption, Developing countries, *Energy conservation, Alternate fuels.

As a result of the sharp increase in the price of energy during the 1970s and the associated changes in the relative costs of alternative energy resources, all countries need to conserve energy and to replace expensive sources of energy with cheaper ones. The subjects of energy conservation and fuel substitution have therefore assumed increasing importance worldwide. The cement industry is one of the relatively energy-intensive industries with energy-related costs accounting for a major portion of the costs of manufacturing cement. The recent experience of the industrialized countries has shown that energy costs per unit of output of cement could be significantly reduced through a variety of measures ranging from better housekeeping, energy management, and improved monitoring and control systems to more capital-intensive investments in modifications to existing plant and equipment and conversion to more energy-efficient processes. This report aims at a broad presentation of concepts, measures and issues relevant to achieving such improvements in energy efficiency in the cement industry based on experience in both industrialized and developing countries. In so doing, it identifies possible constraints to the successful execution of energy efficiency programs that can be found in many developing countries, and indicates some measures that can be taken at the government, industry and plant levels to stimulate the achievement of increased energy efficiency at the plant level. (Copyright (c) 1983 The International Bank for Reconstruction and Development/The World Bank.)

PB84-217702/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Training and Visit Extension,
D. Benor, and M. Baxter. c1984, 214p ISBN-0-8213-0121-7
Library of Congress catalog card no. 82-20267
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC.

Keywords: *Training, *Crops, *Agricultural economics, *Agricultural extension services, Specialized training, Farm crops, Government, *Productivity.

The training and visit (T&V) system of agricultural extension aims at building a professional extension service that is capable of assisting farmers in raising production and increasing incomes and of providing appropriate support for agricultural development. The system has been widely adopted in many countries. Considerable variation in the system exists within and between countries, reflecting particular agroecological conditions, socioeconomic environments, and administrative structures. To be successful, the training and visit system must be adapted to fit local conditions. Certain features of the system, however, cannot be changed significantly without adversely affecting its operation. These features include professionalism, a single line of command, concentration of effort, time-bound work, field and farmer orientation, regular and continuous training, and close linkages with research. (Copyright (c) 1984 International Bank for Reconstruction and Development/The World Bank.

PB84-217710/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Poor of Bogota: Who They Are, What They Do, and Where They Live.
World Bank staff working paper,
R. Mohan, and N. Hartline. c1984, 107p ISBN-0-8213-0346-5, WP-635
Library of Congress catalog card no. 84-3505.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Urban planning, *Colombia, *Demography, Surveys, Urban areas, *Employment, Unemployment, Statistical data, Developing countries, Households, Bogota(Colombia).

This paper identifies the correlates of poverty by examining in detail the composition and characteristics of the poor in Bogota. This is done by analyzing two household surveys for Bogota in detail. The poor are defined as those who fall on the bottom 30% of household income per capita. People with lower education are more likely to be poor but there are significant proportions of those with secondary and higher education who are also poor. Some life cycle effects are reflected in the fact that poverty is over-represented among children and middle-aged (35-44). Poverty is not concentrated anywhere spatially. Among workers the poor are predominantly blue collar workers and they tend to work long hours. They are not in that sense underemployed. Smaller firms do appear to pay less than large firms. Spatially the poor are about equally represented in every ring but highly concentrated in the South of the city. The poor have higher rates of unemployment at all levels of education.

PB84-217728/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Targeting Food Subsidies for the Needy: The Use of Cost-Benefit Analysis and Institutional Design.
World Bank staff working paper,
A. Mateus. c1983, 89p ISBN-0-8213-0295-7 WP-617
Library of Congress catalog card no. 83-25900.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Food supply, *Food services, *Financial management, *Cost benefits, *Food, Nutrition, Project management, Pakistan, Brazil, Colombia, Policies, Benefit cost analysis, India, Indonesia, Economic growth, Case studies.

The paper analyzes alternative schemes for targeting food subsidies to nutritionally needy groups that have been implemented in several countries and attempts to draw from their analyses lessons for the set-up or possible reforms in food policy systems. The types of experience reviewed range from ration shops targeted geographically (India, Brazil); self-targeting using an inferior-goods approach (Pakistan, Bangladesh); food-coupon systems targeted by income (Sri Lanka), and by health status (Colombia, Indonesia); and special intervention programs (such as those directed at preschool children plus mothers), school feeding programs and most-vulnerable-group targeting, that have been followed in more than a dozen of developing countries. One of the main contributions of the paper to the literature on this topic is the construction and actual implementation of a cost-benefit analysis to evaluate food policy systems. (Copyright (c) 1983 The International Bank for Reconstruction and Development/The World Bank.)

PB84-217942/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Planning in Developing Countries: Lessons of Experience.
World Bank staff working paper,
R. Agarwala. c1983, 74p WP-576, ISBN-0-8213-0303-1
Library of Congress catalog card no. 83-25985. Also pub. as International Bank for Reconstruction and Development, Washington, DC. rept. no. MANAGEMENT AND DEVELOPMENT SER-3.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 20433.

Keywords: *Management planning, *Economic development, *Regional planning, *Economic analysis, Investments, Incentives.

This paper reviews the experience of planning in developing countries in the post-World War II period. The main conclusions are: In most developing countries, planning failed to live up to expectations. The technical, administrative, and political causes of the failure of comprehensive planning in mixed economies are inherent in the process and are unlikely to be remedied merely by more strenuous efforts to strengthen the planning machinery. Instead, planning should be reoriented through a streamlining of the incentive system and public investment program and through emphasis on consultations, flexibility, selectivity, and coordination in the formulation of plans.

PB84-218627/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
Brazil: Human Resources Special Report. Volume 1,
P. T. Knight, R. Moran, T. W. Merrick, C. Lluch, and D. Mahar. c1979, 260p
See also Volume 2, PB84-218635.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC.

Keywords: *Productivity, Brazil, Developing countries, *Demography, *Employment, *Health, Nutrition, Trends, Socioeconomic status, Economic growth, Public policies.

The Brazil Human Resources Special Report focuses on population dynamics and on the development of human resources or, from a somewhat different point of view, the provision of basic services in the broader context of development. By combining historical and prospective analysis, its aim is to facilitate the search for effective policies and efficient programs. (Copyright (c) 1979 The International Bank for Reconstruction and Development/The World Bank.)

PB84-218643/GAA PC **A17**/MF **A01**
Small Business Administration, Washington, DC.
State of Small Business: A Report to the President, Together with the Annual Report on Small Business and Competition of the U.S. Small Business Administration.
Final rept.
Oct 82, 390p

Keywords: *Economic analysis, Recessions, Unemployment, *Small businesses, Business failures, Job creation.

With this Document the Administration submits its second annual report on the state of small business to the U.S. Congress in compliance with the provisions of P.L. 96-302. This report concludes that 1982 was a difficult year for small businesses: many industries experienced a decline in sales receipts, profits, and employment. However, the declines sector as they were to the large business sector. The State of Small Business: A Report of the President Consists of Seven chapters and five appendixes. Chapter 1 reviews the state of small business in 1982 and concentrates on the effects of the 1982 recession. Chapter 2 provides information on the number of small businesses in U.S. economy and their distribution by industry and state. The chapter also examines employment by small business as well as output and sales of small business. Both the Government and the business community are interested in how and where new jobs are created in the economy. Chapter 3 discusses the dynamics of small business job generation and the methods for measuring creation. This chapter concludes that the share of new jobs contributed by small firms varies.

PB84-219260/GAA PC **A03**/MF **A01**
Small Business Administration, Washington, DC.
Utility Competition with Small Businesses: Recommendations for States on Utility Energy-Related Programs and the Commercial and Apartment Conservation Service Program (Second Edition).
Final rept.
Mar 84, 47p

Keywords: *Energy, Prices, Regulations, *Small businesses, Energy conservation, Market, Subsidies.

The subject of utility entry into unregulated private markets is of growing concern to the small business community. Over the past few years there has been increasing interest by utilities to diversify into other markets, particularly in the areas of energy conservation and renewable energy. Such activity has frequently resulted in complaints of unfair competition from small business competitors. The most common form of unfair competition is the use of ratepayer funds to subsidize utility entry at lower prices into these unregulated markets. Other utility practices have also raised legitimated concerns.

PB84-220276/GAA PC **A04**/MF **A01**
Regional Services Corp., Inc., Columbus, IN.
Comparison of Leachate Characteristics from Selected Municipal Solid Waste Test Cells.
Research rept.,
R. J. Wigh. Jul 84, 55p EPA-600/2-84-124

Keywords: *Sewage disposal, *Waste disposal, *Leaching, Solid waste disposal, Performance evaluation, Environmental surveys, Comparison.

Sanitary landfills presently provide an economical method for solid waste disposal. Numerous research projects sponsored by U.S. EPA have involved monitoring refuse test cells to provide a better understanding of the processes that occur within the refuse mass and the potential environmental effects of sanitary landfills. The research effort described in this report was undertaken to determine if leachate characteristics from several different test cells were similar. Normalized weighted mean leachate concentration histories and mass removals were compared graphically for two field-scale cells and three small-scale cells. A simple semi-empirical exponential model of leachate concentrations adequately described concentration trends. Identical performance of the test cells was not indicated from the data analysis, but rather a range of performance.

PB84-220722/GAA MF **A01**
International Bank for Reconstruction and Development, Washington, DC.
World Bank Glossary: English-French-Spanish.
c1981, 135p
Text in English, French, and Spanish.
Microfiche copies only. Paper copy available from World Bank, 1818 H St., NW, Washington, DC. 200433.

Keywords: *Banking, Terminology, English language, French language, Spanish language, Global.

This second edition of the World Bank Glossary has been revised and expanded by the Terminology Unit of the Bank's Language Services Division in close collaboration with the English, French and Spanish Translation Sections. The glossary is primarily intended for the guidance of the staff and free-lance translators and interpreters employed by the Bank. It still contains few purely sectoral concepts and is mainly confined to terms that occur frequently in documents of the World Bank Group but are not generally found in dictionaries. (Copyright (c) 1981, World Bank.)

PB84-222421/GAA PC **A04**/MF **A01**
Office of Technology Assessment, Washington, DC.
Technology, Renewable Resources, and American Crafts: Background Paper.
May 84, 63p* OTA-BP-F-27
Library of Congress catalog card no. 84-601063.

Keywords: *Handicrafts, Natural resources, Conservation, Technology assessment, Policies.

This report summarizes technology's effects on crafts - traditional and contemporary - that use renewable resources as raw materials. American crafts play important economic and cultural roles. The economic impact is difficult to document, but several hundred thousand people are directly involved, and crafts contribute about $10 million annually in each of several states. The Federal Government plays an important role in supporting American crafts, protecting renewable resources, and developing technology. The connections among these activities have not been made explicit, and ineffective policies result. Congressional action will continue to effect crafts that depend on renewable resources for raw materials. Among those crafts are scrimshaw, woodworking, basketry, and leatherworking. Renewable resource issues include illegal traffic in wildlife; resource supplies for crafts; resource losses in developing countries; education and craft training.

PB84-226505/GAA PC **A02**/MF **A01**
Environmental Research Lab., Narragansett, RI.
Effects of Stocking Density on Survival of Laboratory Cultured Summer Flounder 'Paralichthys dentatus' Larvae.
Journal article,
G. Klein-MacPhee. 1981, 3p EPA-600/J-81-671
Pub. in Rapp. P-v. Reum. Cons. int. Explor. Mer. 178, p505-506 1981.

Keywords: *Fishes, *Aquaculture, Survival, Laboratories, Mortality, Density(Mass/volume), Bioassay, Toxicology, Reprints, Flounder.

Studies are being conducted to determine standard laboratory culture conditions for rearing summer flounder larvae to be used in toxicological bioassays. Experiments were conducted using the type of container and physical conditions use in the long term chronic toxicological bioassays. Possible causes of increased mortality and developmental abnormalities at increasing stocking densities are discussed. Optimum density in the 6 liter closed system was about 20 fish per liter.

PB84-227156/GAA PC **A05**/MF **A01**
Puerto Rico Univ., Mayaguez. Dept. of Civil Engineering.
Assessment of the Wastewater Reuse Potential in Puerto Rico.
Final technical rept.,
R. A. Rios. Jun 84, 100p OWRT-A-067-PR(1)
Contract DI-14-34-0001-1141
Prepared in cooperation with Puerto Rico Univ., Mayaguez. Water Resources Research Inst

Keywords: *Water supply, *Irrigation, *Puerto Rico, Allocations, Volume, Sewage treatment, Municipalities, Shortages, Water quality, Assessments, Evaluation, Sugarcane, Rice plants, *Waste water reuse.

Puerto Rico has seen an increase in water rationing in the last ten years. This has been caused mainly by an increase in water withdrawals and a general lack of planning in regards to the water resource. The problem of quantity in reference to potable water supply has been compounded by the problem of quality since almost all of the surface water bodies of the Island have problems with high coliforms counts and Schistosoma mansoni (bilharzia). This work analyzes the reuse aspect in the optimal allocation of the water resource in Puerto Rico. An assessment is made of the wastewater reuse potential in the Island with emphasis on the reuse of municipal wastewaters. The current situation is evaluated and then projections are made in order to develop and evaluate a number of feasible reuse alternatives. The alternatives are evaluated and the use of secondary treated municipal effluent for sugarcane irrigation is selected as the best alternative.

PB84-227529/GAA PC **A04**/MF **A01**
General Accounting Office, Washington, DC. National Security and International Affairs Div.
Use of a Capital Saving Technology Approach in AID's (Agency for International Development) Development Assistance Program.
26 Jul 84, 51p GAO/NSIAD-84/142, B-215612

Keywords: *Economic analysis, *Financial management, Unemployment, Capital, *Technology transfer, Technical assistance, Information systems, Recommendations, Capital saving technology.

During the past decade, high unemployment and short supplies of capital in developing countries created a need for labor intensive development methods and capital saving tools. Recognizing this need, the Congress enacted section 107 of the International Development and Food Assistance Act of 1975 which authorized the Agency for International Development (AID) to support a new and expanded private effort to develop and disseminate capital saving technologies appropriate for developing countries. AID acted to implement the congressional directive in the late 1970s but has not maintained its earlier emphasis on promoting this technology as one approach to development. GAO believes that, since AID continues to endorse capital saving technology as one approach to development, it could take a number of actions at little cost which would re-emphasize the role of capital saving technology in developing countries and facilitate application of the concept by Agency staff.

PB84-227594/GAA PC **A05**/MF **A01**
Transportation Research Board, Washington, DC.
Transportation Management, Finance, and Pricing Issues,
J. Gruver, W. Reulein, D. T. Hartgen, T. F. Humphrey, and M. D. Meyer. 1983, 87p* TRB/TRR-940
Library of Congress catalog card no. 84-14724.

Keywords: *Transportation management, Urban areas, Communities, Planning, Socioeconomics, Parking, Energy, Rapid transit railways.

The 11 papers in this report deal with the following areas: estimating the impacts of changing highway conditions; long-term projection of highway system condition; organizational analysis of a state department of transportation program development process; economic evaluation of highway investment needs; integration of land use, transportation, and energy planning in midsized cities; transportation evaluation in community design: an extension with equilibrium route assignment; parking-requirement reduction process for ridesharing; current practices, evolving issues, and future directions; prediction of land use traffic impact; public management in a time of declining resources; value engineering in the Pennsylvania Department of Transportation; and, Pennsylvania's inventory reduction program.

PB84-228147/GAA PC **A11**/MF **A01**
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
Assessment of the Potential for Water Reuse in the Pulp and Paper Industry.
Final technical rept. 1 Sep 81-30 Sep 82,
J. C. Wyvill, J. C. Adams, G. E. Valentine, Jr., and T. C. Shelnutt. Mar 84, 238p OWRT-C-10041-R(1468)(1), , OWRT/RU-84/1
Contract DI-14-34-001-1468
Prepared in cooperation with Georgia Inst. of Tech., Atlanta. Environmental Resources Center.

Keywords: *Water pollution, *Paper industry, Performance evaluation, Assessments, Water pollution, Feasibility, Water pollution economics, *Waste water reuse.

This research study assesses the current extent of water reuse and recycle in the U.S. pulp and paper industry and identifies the potential for increasing overall water reuse and recycle. The study focuses on the 10 largest water consuming groups in the industry, found to utilize nearly 85% of the total water withdrawn by the entire industry. Using a systems analysis approach, major subprocess functions are identified and reviewed for technical limitations to further recycle and reuse. Regional, environmental, and economic constraints are also identified and projections made of the feasible water savings potential for the production groups studied. The study closes with an identification of areas where further research is needed to encourage water reuse and recycle.

PB84-229038/GAA MF **A01**
International Labour Office, Geneva (Switzerland).
Roads and Resources: Appropriate Technology in Road Construction in Developing Countries,
G. A. Edmonds, and J. D. G. F. Howe. c1980, 204p
ISBN-0-903031-69-8
Sponsored in part by Intermediate Technology Publications Ltd., London (England).
Microfiche copies only.

Keywords: *Roads, *Construction, Resources, Cost effectiveness, Manpower, Developing country application, Appropriate technology

The major premise of this book is that labor intensive methods of road construction are efficient and cost effective if there is a committment to the construction of the road on the part of the laborers, whether it comes from their being paid or their seeing the benefits to them of the completion of the project. The book covers appropriate road construction technology and the institutional framework, road construction and resource use, planning and administration of labor-based road construction programs, equipment for labor-based road construction, and the private construction sector and appropriate technology. Four case studies are included.

PB84-230952/GAA PC **E07**/MF **E07**
Mariculture Systems Ltd., Galway (Ireland).
Guide to Longline Mussel Cultivation.
Technical bulletin,
N. Herriott. Apr 84, 105p
Sponsored in part by National Board for Science and Technology, Dublin (Ireland).

Keywords: *Aquaculture, *Ireland, Equipment, Site surveys, Planning, Anchoring, Fouling, Harvesting, Storage, Financing, Economic models, Marketing.

The farming of mussels has become the focus of considerable interest in Ireland in recent years. Much of this is due to the commercial success of the Wexford ground culture and processing operation. Techniques used to date have included exploitation of subtidal and intertidal populations, relaying, Bouchot culture and suspended raft culture. The 'extensive' ground culture type of mussel production, as practiced in Holland, is well documented as is Bouchot culture, the intensive type of mussel farming used intertidally in France. Throughout this publication 'mussel farming' or 'mussel culture' is used in its narrowest sense to describe the 'intensive' culture of mussels using suspended methods, particularly longline rigs.

PB84-231240/GAA PC **A06**/MF **A01**
Great Lakes Basin Commission, Ann Arbor, MI.
Watershed Handbook. A Management Technique for Choosing Among Point and Nonpoint Control Strategies.
Research rept.,
T. J. Monteith, R. A. C. Sullivan, T. M. Heidtke, and W. C. Sonzogni. Aug 81, 112p EPA-905/9-84/002
Sponsored in part by National Oceanic and Atmospheric Administration, Ann Arbor, MI. Great Lakes Environmental Research Lab.

Keywords: *Water pollution, *Water quality, *Management planning, Handbooks, Municipalities, Industries, Cost effectiveness, Phosphorus, Combined sewers, Cost estimates, Estimating, Water pollution, Farms, Streams, River basins, Point sources, Nonpoint sources.

Watershed is a simple, 'desk top' accounting system designed to help water quality planners assess alternative management strategies for controlling point and nonpoint source pollution inputs from large areas (100 square miles or greater) to a receiving water. Its goal is to find the best mix of point and nonpoint source management techniques to achieve a given load allocation for a receiving waterbody. Through a cost-effectiveness ranking scheme, Watershed identifies the order in which remedial measures could be implemented to achieve the greatest annual water quality improvements at the least cost. This handbook presents the mechanics and background data for using the Watershed system.

PB84-232412/GAA PC **E06**/MF **E06**
Sheffield Univ. (England). Dept. of Building Science.
Model Study of Convective Heat Transfer from Roof-Mounted Flat Plate Solar Collectors,
P. S. Charlesworth. Aug 83, 103p BS-75

Keywords: *Heat transfer, Wind tunnels, Performance evaluation, Wind velocity, Graphs(Charts), *Solar collectors.

The conversion of the sun's energy, which falls on the earth's surface as thermal radiation, into a usable form can be accomplished by a variety of techniques and systems, for example solar ponds, solar cookers and flat place collectors. It is with this last named device that the present study is concerned. The aim of the experiments, reported in this report, is to evaluate natural and forced convective heat transfer coefficients for a plate situated in various locations on a house roof. The dependence of these values not only with wind velocity but also with wind direction, roof pitch and plate position on the roof was also investigated.

PB84-233048/GAA PC **A02**/MF **A01**
Pacific Northwest Forest and Range Experiment Station, Portland, OR.
Aerial Spray Adjuvants for Herbicidal Drift Control.
Forest Service general technical rept.,
H. Gratkowski, and R. Stewart. 1973, 25p FSGTR/PNW-3

Keywords: *Herbicides, *Weed control, *Forestry, Windward drift, Spraying, Aircraft, Emulsions, Thickners(Materials), Foams, Reforestation.

Increased public concern about pesticides requires that foresters reduce drift and insure precise application of herbicides to the area requiring treatment. Drift control is necessary near waterways and other ecologically sensitive areas. This publication discusses available drift control adjuvants for herbicidal sprays. These include invert emulsions, thickening agents, particuiating agents, and foam sprays. Commercially available adjuvants are described and their use, advantages are discussed. Thickening agents and foam sprays show special promise for drift reduction in aerial application of herbicides on forest lands.

PB84-233568/GAA PC **E04**/MF **E04**
Transport and Road Research Lab., Crowthorne (England).
Kenya Maintenance Study on Unpaved Roads: Optimum Maintenance Strategies.
Laboratory rept.,
T. E. Jones. c1984, 41p TRRL/LR-1112

Keywords: *Roads, *Maintenance, *Kenya, Developing countries, Methodology, Graders.

This report describes a study of the effect of various maintenance strategies utilizing both mechanical plant and labor intensive methods, on the performance of unpaved roads in Kenya. The results show that on properly constructed roads, towed graders can carry out the surface maintenance as effectively as motor graders. Towed graders can be produced in most if not all developing countries and if augmented by labor intensive methods would reduce the reliance of these countries on imported machinery for the maintenance of unpaved roads. The use of various mechanical drags for maintaining low volume roads was quantified and recommendations made for suitable designs of drag for differing road conditions. Results of labor intensive trials showed that they could be effective but that this form of maintenance is strongly influenced by the degree of supervision. (Copyright (c) Crown Copyright 1984.)

PB84-234749/GAA PC **E04**/MF **E04**
Transport and Road Research Lab., Crowthorne (England).
Dust Emission from Unpaved Roads in Kenya.
Laboratory rept.,
T. E. Jones. c1984, 32p TRRL/LR-1110

Keywords: *Air pollution, *Roads, *Kenya, *Motor vehicles, Chemical compounds, Stabilizers(Agents), Fines, Particles, Bitumens, Chemical treatment.

This report describes the problems of dust emitted from unpaved roads in developing countries through the action of traffic. The significance of the loss of material is discussed in terms of the increased regravelling requirement and attention is drawn to the effect that dust has on traffic accidents by reducing visibility. It describes a study in Kenya which measured the rate of loss of airborne fine materials dispersed from the road relative to the speeds and types of vehicle. Recent experimental studies in the United States of America and Canada are reviewed together with a summary of their results. Methods are also reviewed of utilizing bitumens, chemicals, waste chemicals and local materials for dust-proofing unpaved roads, and a critical appraisal is made of the techniques. The conclusions of the research are that most of the dust proofing treatments currently available vary considerably in their effectiveness and, with the exception of the local materials, are usually more expensive than bituminous surface dressing. Where the latter techniques are unavailable, chemical stabilizers can provide an alternative solution. (Copyright (c) Crown Copyright 1984.)

PB84-235688/GAA PC **A04**/MF **A01**
Transportation Research Board, Washington, DC.
Diesel Fuel Quality and Effects of Fuel Additives.
Final rept.,
D. S. Moulton, and N. R. Sefer. May 84, 72p TRB/NCTRP/SYN-3, ISBN-0-309-03569-4
Contract DTUM-81-C-72012
Prepared in cooperation with Southwest Research Inst., San Antonio, TX. Report on National Cooperative Transit Research and Development Program, Synthesis of Transit Practice. Library of Congress catalog card no. 84-50866.

Keywords: *Fuels, *Transportation management, *Buses(Vehicles), Benefit cost analysis, Blends, Air pollution control, Fuel consumption, Maintenance.

This synthesis will be useful to administrators, engineers, and others in the transit industry concerned with evaluation of diesel fuel and fuel additives used in transit buses. Detailed information is presented on costs, benefits, and adverse effects of available fuel additives and related products. In recent years, environmental awareness, economic pressures, and a general decline in crude oil quality have caused transit operators to seek ways to make use of fuel additives and less expensive blends. This report of the Transportation Research Board includes information on the evaluation of fuel additives and related products in terms of their effects on vehicle maintenance requirements, emissions control, fuel economy, fuel storage, and engine performance.

PB84-237775/GAA PC **A04**/MF **A01**
Institute of Gas Technology, Chicago, IL.
Biogasification of Wood.
Final rept. 1 Jul 82-28 Apr 83,
D. E. Jerger, A. Razik, and D. P. Chynoweth. Apr 84, 75p GRI-84/0078
Contract GRI-5080-323-0428

Keywords: *Biomass, *Methane, *Wood, *Gasification, Anaerobic processes, Hardwoods, Fermentation, Decomposition, Feasibility, Digestion(Decomposition), Performance evaluation, *Bioconversion, Chemical feedstocks.

Work conducted recently at IGT under the GRI Land Biomass Program has demonstrated that significant conversion of different hardwood species can be accomplished without pretreatment other than particle size reduction. The objective of this study was to document the previously observed anaerobic biomethanogenic fermentation of wood using detailed physical and chemical analyses during the course of decomposition. IGT used enrichment techniques to develop a microbial inoculum that can convert woody biomass to methane without pretreatment. Methane yields of 5 to 6 SCF/lb of wood added have been achieved for several hardwoods which relates to a conversion of approximately 80% of the structural carbohydrates found in wood. These results were confirmed in this study using 3-L batch reactors fed hybrid poplar. Effluent analyses monitored during the digestion period indicated that the fermentation was stable. Organic analysis showed a 75% reduction in the cellulose fraction of poplar following the digestion period. These data refute currently accepted theory that wood is refractory to anaerobic digestion and suggest that biogasification is technically feasible and needs further documentation and study.

PB84-238591/GAA PC **A04**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Sociological Constraints and Social Possibilities for Production of Goats in Western Kenya.
Technical rept.,
A. L. Noble, and M. F. Nolan. Mar 83, 54p TRS-18
Grant AID/DSAN/XII/G-0049
Prepared in cooperation with Missouri Univ.-Columbia. Dept. of Rural Sociology.

Keywords: *Ruminants, *Social change, *Kenya, Production, Females, Milk, Population growth, Meat, Attitude surveys, History, Small farms.

The goal of the Small Ruminant Collaborative Research Support Program (SR-CRSP) in Kenya is to develop and evaluate the introduction of a dual purpose goat (i.e. raising goats for meat and milk) for the small farms of Western Kenya. This area of Kenya is densely populated with a high rate of population growth. This study was undertaken in an effort to gain an understanding of the social organization of small farm agriculture in Western Kenya with particular emphasis on the role of women in that setting. The data reported were gathered in the Samia location, Busia District of Western Province during 1980-81. As part of a general concern with equitable distribution in current agricultural development programs, more and more attention has focused on women's contributions to agricultural production, particularly in Sub-Saharan Africa.

PB84-241041/GAA PC **A08**/MF **A01**
Jones and Stokes Associates, Inc., Sacramento, CA.
Final Environmental Impact Statement for Metropolitan Wastewater Management Commission Sludge Management Plan, Eugene-Springfield, Oregon.
Jun 84, 171p EPA/910/9-84/119
See also PB84-122985.

Keywords: *Waste management, *Environmental impacts, *Sewage treatment, Land use, Geology, Soils, Public health, Water quality, Ground water, Farm crops, Lagoons(Ponds), Substitutes, Land disposal, Eugene(Oregon), Springfield(Oregon).

A draft environmental impact statement (EIS) was distributed in October of 1983 to discuss the environmental implications of managing municipal sludge in the Eugene-Springfield, Oregon area. It considered four alternative facilities and process combinations for storing, drying, and reusing sludge, and looked at four locations to house the physical facilities. The plan being proposed by the Metropolitan Wastewater Management Commission (MWMC), which represents Eugene, Springfield, and Lane County, Oregon, includes a 5.5-mile digested sludge conveyance pipeline, mechanical sludge conditioning, faculatative sludge lagoon storage, air drying beds, and reuse of the sludge on agricultural land. This final EIS has been prepared to respond to comments on the draft EIS.

PB84-242122/GAA PC **A04**/MF **A01**
California Univ., Berkeley.
Effects of Acid Rain on Plant Microbial Associations in California.
Research rept. (Final),
D. Harris, and E. A. Paul. 13 Apr 84, 69p ARB-R-84/232
Contract ARB-A2-087-32

Keywords: *Leguminous plants, *Air pollution, Growth, Soil properties, Exposure, Nitrogen fixation, Plant physiology, Fertilizers, Phosphorus, Fungi, Tolerances(Physiology), Carbon 14, Isotopic labeling, Respiration, Yield.

The effects of simulated acid rain of pH 5.6 to 3.0, with ionic composition similar to that found in California, on Trifolium repens, Lupinus densiflorus and L. benthamii grown in two soils were tested. The interactions of treatment intensity, soil type, phosphorus uptake and mycorrhizal influences on growth, carbon fixation and allocation and nitrogen fixation were determined. Acidic treatments generally decreased plant growth, nodulation and nitrogenase activity. The exposure of plants to a large number of simulated rainfall conditions of shorter duration did not result in the negative growth effects. Plants adequately supplied with P, either as fertilizer or by mycorrhizal fungi, were much more resistant to conditions caused by acidic precipitation and in some cases growth increases were found.

PB84-242189/GAA PC **A03**/MF **A01**
International Statistical Inst., Voorburg (Netherlands).
Contraceptive Use in Sri Lanka,
G. Immerwahr. Jan 81, 43p AID-PN-AAK-008
Contract AID/csd-3606
Prepared in cooperation with World Fertility Survey, London (England).

Keywords: *Birth control, *Contraceptives, *Sri Lanka, Utilization, Trends, Developing countries, Demographic surveys, Developing country application.

This study analyzes data from the Sri Lanka Fertility Survey not published in the Survey's First Report in order to identify the determinants of contraceptive use and to estimate the births averted by female sterilization, Sri Lanka's main contraceptive method (CM). Discussed in turn are the use of modern reversible CM's (the pill, IUD loop, and condom); female sterilization; year of use of reversible CM's or sterilization; CM first used; a comparison of Survey results with data from the Sri Lanka Family Health Bureau; the reasons for non-use and determinants of ever-use of contraception; current contraceptive use; and the effect of contraception on fertility.

PB84-242197/GAA PC **A03**/MF **A01**
Thai Univ. Research Association, Bangkok.
Socio-Economic Aspects of Poverty in Thailand. A Summary Report of the Workshop on Raising Agricultural Income and Productivity of Poor Farmers,
B. Shinawatra, and M. Krongkaew. Mar 80, 44p AID-PN-AAK-007
Contract AID-493-9030-T

Keywords: *Thailand, *Agricultural economics, *Productivity, *Water resources, Agricultural chemistry, Recommendations, Developing countries, Developing country application, Tenants.

In order to identify impediments to rural development in Thailand and thereby spur proposals for development interventions, A.I.D. funded a series of three in-country workshops. This report, encompassing four papers on poverty in rural Thailand, presents the proceedings of the first workshop. The first paper examines the effects of irrigation and water control/management on productivity and income in rural Thailand and concludes that irrigation is the primary income level determinant. The second paper analyzes land use and management in the context of the interrelatedness of the following production factors: the natural and physical environment; social, economic, and political conditions; resources; technology; and the farmers themselves. Noting a widening gap between rich and poor in rural Thailand, the third paper details the importance, to the poorer farmers, of off-farm employment and income (although, on-farm earnings per hour are still higher). The fourth and final paper, on the socioeconomic characteristics of farmers groups found that villages identified as poor by other villagers tended to be landless farmers and/or farm laborers. Appended are a description of the workshop's background, the workshop schedule, and a list of the participants.

PB84-242403/GAA PC **A04**/MF **A01**
Agency for International Development, Washington, DC.
Sederhana: Indonesia Small-Scale Irrigation.
Project impact evaluation rept. no. 29,
S. Holloran, G. L. Corey, T. Mahoney, and J. Stepanek. Feb 82, 74p AID-PN-AAJ-608

Keywords: *Agricultural economics, *Irrigation, *Indonesia, Production, Rice plants, Java Island, Sulawesi Island, Water supply, Manpower, Profits, Weather, Developing country application.

A.I.D.'s Sederhana project was designed to increase Indonesian rice production by rehabilitating or constructing small, technically simple irrigation systems. An A.I.D. team visited 29 subprojects (SP) to prepare this review of Sederhana's impact. The project led to substantial increases in rice production on Java and Sulawesi, confirming the assumption that farmers could make immediate use of additional water. In Sumatra, however, the production impact was not encouraging, due to adverse environmental conditions and farmer resistance to growing labor-intensive, non-cash crops.

PB84-242668/GAA PC **A06**/MF **A01**
Southwest Research Inst., San Antonio, TX.
Technical Guide to Water Management on Small Farms,
D. L. Black, and H. M. Mason. 1983, 102p AID-PN-AAJ-437
Contract AID/ta-C-1479

Keywords: *Irrigation, *Water supply, *Farming, *Crops, Requirements, Grading(Earthworking), Slope, Drainage, Water distribution, Distribution systems, Sprinkler irrigation, Salinity, Ditches, Evaporation, Developing country application, Trickle irrigation.

In recent years, supplemental irrigation systems have been used to boost production in rain-scarce agricultural areas. This report offers a guide to some technologies developed under A.I.D. auspices to help small farmers maximize the use of scarce water resources. Individual chapters, illustrated with photographs and drawings, are devoted to: (1) crop water requirements; (2) land grading for water control; (3) irrigation methods; (4) water quality and crop production; (5) drainage; (6) water measurement and distribution systems; (7) watercourse management; and (8) irrigation water supply.

PB84-242676/GAA PC **A09**/MF **A01**
Agency for International Development, Washington, DC.
Sudan: The Rahad Irrigation Project.
Project impact evaluation rept. no. 31,
P. Benedict, A. H. Ahmed, R. Ehrich, and S. F. Lintner. Mar 82, 183p AID-PN-AAJ-610

Keywords: *Sudan, *Agricultural economics, *Irrigation, *North Africa, Assessments, Investments, Cotton plants, Nuts, Exports, Prices, Marketing, Developing country application.

Although the Rahad Irrigation Project in Sudan, partly AID-funded and nearly complete, has been operating for only four seasons, it faces problems which threaten its viability. Designed to maximize use of government investments in Nile water management, to upgrade the living standards of 100,000 herders and farmers, and to produce cotton and groundnuts for export, the project is pursuing full mechanization and 100% intensive rotation of crops. The Corporation has not coped well with several problems - managing a mechanized operation, erroneously perceived labor shortages, and tenant dissatisfaction.

PB84-242684/GAA PC **A04**/MF **A01**
Agency for International Development, Washington, DC.
Guatemala: Development of the Institute of Agricultural Science and Technology (ICTA) and Its Impact on Agricultural Research and Farm Productivity.
Project impact evaluation rept. no. 30,
J. K. McDermott, and D. Bathrick. Feb 82, 58p AID-PN-AAJ-178

Keywords: *Guatemala, *Agricultural economics, *Crops, *Research and development, Research projects, Seeds, Yield, Beans, Grain sorghum, Production, Nutritive value, Plant genetics, Fertilizing, Planting, Recommendations, Developing country application, Small farms, Maize.

In 1975 A.I.D. initiated a project to increase the production and nutritive quality of basic crops in Guatemala and to develop the capability of the Institute for Agricultural Science and Technology (ICTA) to generate and promote the use of improved small farm technology. This report describes the project's setting and activities, outlines its impact, and summarizes its lessons.

PB84-242692/GAA PC **A05**/MF **A01**
Agency for International Development, Washington, DC.
Kenya: Rural Roads.
Project impact evaluation rept. no. 26,
J. E. Roberts, C. Clapp-Wincek, C. Vandervoort, and D. W. Brokensha. Jan 82, 82p AID-PN-AAH-972

Prepared in cooperation with California Univ., Santa Barbara, and Department of Transportation, Washington, DC.

Keywords: *Roads, *Kenya, *Rural areas, Developing countries, Project management, Maintenance, Developing country application.

A.I.D.'s ongoing rural roads project in western Kenya is designed to provide isolated rural areas with all-weather accessibility to production and social services, largely through a program to identify, construct, and maintain 14,000 kms of rural access roads (RAR's). This study by an AID/W team details the project's impact to date.

PB84-242700/GAA PC **A06**/MF **A01**
Agency for International Development, Washington, DC.
Philippines: Bicol Integrated Area Development.
Project impact evaluation rept. no. 28,
J. G. Sommer, R. Aquino, C. A. Fernandez, II, F. H. Golay, and E. Simmons. Jan 82, 119p AID-PN-AAJ-179
Prepared in cooperation with De La Salle Univ., Manila (Philippines), and Cornell Univ., Ithaca, NY.

Keywords: *Philippines, *Agricultural economics, Farms, Services, Project planning, Irrigation, Land use, Developing country application.

The Bicol River Basin Development Program (BRBDP) in the Philippines is important because it melds three themes current in development thinking - a concerted focus on a discrete geographic area; systematic integration of various services down to the farm level; and income redistribution and equitable economic growth. This report assesses the BRBDP's impact, emphasizing seven A.I.D. projects.

PB84-242718/GAA PC **A06**/MF **A01**
Agency for International Development, Washington, DC.
Korean Agricultural Research: The Integration of Research and Extension.
Project impact evaluation rept. no. 27,
D. I. Steinberg, R. I. Jackson, K. S. Kim, and H. K. Song. Jan 82, 115p AID-PN-AAJ-606

Keywords: *Research amd development, *Agriculture, *Korea, Plant genetics, Rice plants, Yield, Farm crops, Recommendations.

In the context of a Government of Korea (GOK) strategy to improve rural life, A.I.D. funded a 1974-80 project to strengthen the GOK's agricultural research (AR) service. The project paper was underestimating current experimental yields and calling for breakthroughs that had already occurred, e.g., development of high-yield varieties (HYV) that helped make Korea self-sufficient in rice by 1975. Concentration on rice led to a deemphasis on other important crops. Thus, while project yield increases may be achieved by their 1984 target date, overall national targets will not be met.

PB84-242726/GAA PC **A05**/MF **A01**
Agency for International Development, Washington, DC.
Panama: Rural Water.
Project impact evaluation rept. no. 32,
R. Meehan, A. Viveros-Long, J. M. Hernandez, and S. de Heckadon. May 82, 86p AID-PN-AAJ-609

Keywords: *Water supply, *Rural areas, *Panama, Distribution systems, Pumps, Manpower, Maintenance, Performance, Public health, Mortality, Developing country application.

Toward attaining health for all by the year 2000, Panama's Department of Environmental Health (DEH) began a program in 1970, and was assisted by A.I.D. from 1972-81, to provide 500 piped water systems and 1,300 handpumps to small villages. This report analyzes the impact of this project. By 1980 562 water systems had been completed and access to piped water was nearly universal. Half the systems were gravity-fed the others had electric, diesel, and occasionally gasoline pumps. Villagers organized community health committees which contributed labor, local materials, and cash and made a commitment to operate and maintain the completed systems. Personnel from all communities were trained to handle simple repairs.

PB84-243187/GAA PC **A06**/MF **A01**
Agency for International Development, Washington, DC.
Effective Institution Building: A Guide for Project Designers and Project Managers Based on Lessons Learned from the AID (Agency for International Development) Portfolio.
Program evaluation discussion paper no. 11,
S. A. Barnett, and N. Engel. Mar 82, 103p AID-PN-AAJ-611

Keywords: *Project planning, *Project evaluation, Regional planning, Economic development, Organizations, Agricultural economics, Developing country application.

Based on a review of the 659 institution-building field projects undertaken by A.I.D.'s four geographic bureaus over a 10-year period, this paper develops guidelines for institution-building project planning and management.

PB84-243260/GAA PC **A02**/MF **A01**
Southern Univ., Baton Rouge, LA.
Societal View and Perceived Social Integration with Emphasis on the Farmer's Cooperatives in Kenya,
J. Moland, Jr., and T. T. Williams. 1979, 25p AID-PN-AAJ-923
Contract AID/csd-3415

Keywords: *Agricultural economics, *Kenya, Rural sociology, Socioeconomic status, Age, Education, Income, Social perception, Developing country application, *Cooperatives, Villages.

To understand the dynamics of farmer cooperatives (FC's) in developing countries, it is necessary to ascertain FC members' sociocultural views and attitudes about cooperation, cohesion, and integration. This AID-sponsored study explores such views in Kenya by analyzing data from a 1978 sample survey of 140 FC members and 48 nonmembers from the rural villages of Masai and Muthetheni. Survey respondents from the two locations were similar with respect to age, education, gross family income, and type of housing, but differed significantly in regard to the male/female ratio and religious affiliation. Perceptions of social integration were measured by responses to five questions on togetherness, equality, confidence in officials, and present-future orientation.

PB84-243286/GAA PC **A06**/MF **A01**
Agency for International Development, Washington, DC.
On-Farm Water Management Project in Pakistan.
Project impact evaluation rept. no. 35,
J. E. Painter, E. Baldwin, S. Malone, E. T. Smerdon, and A. S. Ahmed. Jun 82, 116p AID-PN-AAJ-617

Keywords: *Water supply, *Agricultural economics, *Pakistan, Farms, Waterways(Watercourses), Improvement, Farm crops, Yield, Project planning, Design, Economic impact, Competition, Developing country application.

Watercourse improvements conducted under A.I.D.'s On-Farm Water Management Project in Pakistan have enabled farmers to increase their crop yields and incomes. This report analyzes the setting, history, and impact of the project. While water user associations were not effectively established, farmer awareness of the importance of mutual cooperation grew, informal mechanisms have been quite successful in maintaining watercourses, and demand for watercourse improvements has risen. However, the project failed to increase district government awareness of the need for on-farm water management and failed to institutionalize a mechanism through which that need can continue to be met.

PB84-243294/GAA PC **A12**/MF **A01**
Development Alternatives, Inc., Washington, DC.
AID (Agency for International Development) Experience in Agricultural Research: A Review of Project Evaluations.
Program evaluation discussion paper no. 13,
P. R. Crawford, and A. H. Barclay, Jr. May 82, 261p AID-PN-AAJ-613
Contract AID/SOD/PDC-C-0227

Keywords: *Project evaluation, *Research and development, *Agriculture, History, Trends, Evaluation, Constraints, Financing, Food, Production, Developing country application.

To provide background information for future A.I.D. agricultural research (AR) policy, this paper summarizes A.I.D.'s past and present AR activity and identifies major issues affecting AR projects. First, major trends in AR over the past 10-15 years are reviewed: the development of new technologies adapted to both adverse and optimal conditions; and greater emphasis on onfarm research, communication between researchers and farmers, support for national AR systems in developing countries. and longer time frame requirements. The study indicated the need for more than the standard evaluations of A.I.D. AR projects.

PB84-243302/GAA PC **A05**/MF **A01**
Agency for International Development, Washington, DC.
Community Water Supply in Developing Countries: Lessons from Experience. Evaluation Summaries and Conference Findings.
Program evaluation rept. no. 7,
D. M. Dworkin. Sep 82, 100p AID-PN-AAJ-624

Keywords: *Rural areas, *Water supply, Water distribution, Distribution systems, Recommendations, Water quality, Developing country application.

Because efforts to improve rural water supplies in developing countries have faced increasing criticism and declining donor interest in recent years, A.I.D. began in 1979 a 3-year effort to analyze its experience with community water supply projects. From 1979-1982, 15 projects funded by A.I.D. and other donors in Kenya, Korea, Panama, Peru, Tanzania, Thailand, and Tunisia were evaluated in terms of the water systems' reliability, benefits, and accessibility. This report presents the full proceedings and recommendations of a 1982 conference held to discuss the results of these field evaluations.

PB84-243559/GAA PC **A10**/MF **A01**
Cultural Survival, Inc., Cambridge, MA.
Social Impact of Development on Ethnic Minorities,
D. Maybury-Lewis, T. Barfield, M. Fisher, J. Clay, and R. Huntington. 15 Mar 80, 210p AID-PN-AAH-736
Grant AID/otr-G-1638

Keywords: *Socioeconomic status, *Iran, *Afghanistan, *Sudan, *Brazil, Project planning, Social perception, Survival, Ethnic groups, Cultural deprivation, Public health, Program evaluation, Landownership, Developing country application.

The poor political and economic judgement and lack of sociological imagination that have all too often characterized post World War II development assistance programs have had a negative social impact on the disadvantaged who are the purported beneficiaries of development. Examples of these strategic flaws and their consequences in Afghanistan, Brazil, Sudan, and as dramatically evidenced in the 1977-1979 revolution, Iran, are detailed in this report. A 'cultural survival manifesto' is presented stressing the need to promote local participation and cultural pluralism to ameliorate the social problems that may result from a merely technological approach to project planning. Project successes and failures are analyzed to point out both positive directions and the manner in which some development projects have contributed to genocide, disadvantaged ethnic minorities, and proletarianization caused by displacement from the land.

PB84-243567/GAA PC **A06**/MF **A01**
Agency for International Development, Washington, DC.
Characteristics of Income Distribution in Eastern Paraguay.
General working document no. 2,
C. D. Oberbeck. Sep 79, 117p AID-PN-AAH-714

Keywords: *Paraguay, *Income, *Migration, *Agricultural economics, Land titles, Distribution(Economics), Developing country application, Case studies.

This report examines the distribution of income and productive resources in rural Eastern Paraguay, and reviews some evidence relating to the standard of living experienced by rural Paraguayans. Aggregate data for the entire eastern region are reviewed in Part I.

Departmental census data and disaggregated regional data are reviewed in Part II. Part III presents the results of several case studies, which both amplify the previous discussion and provide a check for reasonableness. Finally, Part IV presents a brief discussion of income distribution policy in Paraguay.

PB84-243799/GAA PC **A11**/MF **A01**
Johns Hopkins Univ., Baltimore, MD. School of Hygiene and Public Health.
Community Based Distribution of Contraception: A Review of Field Experience,
R. W. Osborn, and W. A. Reinke. Jan 81, 244p AID-PN-AAK-341
Contract AID/DSPE-C-0055

Keywords: *Birth control, Distributing, *Contraceptives, Communities, Fertility, Project management, Developing country application.

It has been postulated that community-based distribution (CBD) of contraception can, at a reasonable cost, satisfy substantial unmet demand for effective fertility control. This report presents findings which validate this thesis and addresses the issue of how the CBD approach can be most effectively and efficiently applied.

PB84-244169/GAA PC **A04**/MF **A01**
International Statistical Inst., Voorburg (Netherlands).
Illustrative Analysis: Recent Fertility Trends in Sri Lanka.
Scientific report no. 25,
I. Alam, and J. Cleland. Nov 81, 62p AID-PN-AAK-269
Contract AID/csd-3606
Prepared in cooperation with World Fertility Survey, London (England).

Keywords: *Demography, *Fertility, *Sri Lanka, Developing countries, Demographic surveys, Developing country application.

Sri Lanka is one of the Few South Asian countries achieving a substantial and sustained decline in fertility since the 1950's. This report, based on data collected from 6,812 women under the 1975 Sri Lanka Fertility Survey (SLFS), seeks to augment earlier evidence of this trend and to study the fertility behavior of various subgroups of the population.

PB84-244219/GAA PC **A03**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Comparative Intake and Digestibility of Forages and Byproducts by Sheep and Goats.
Technical rept. series,
L. E. Brown, and W. L. Johnson. 1983, 27p TRS-39
Grant AID/DSAN/XII-G-0049
Prepared in cooperation with North Carolina State Univ. at Raleigh.

Keywords: *Ruminants, *Animal husbandry, Digestion(Biology), Quality, Diets, Animal nutrition, Forage crops, Residues, Comparison.

Comparisons of intake and digestibility of various feedstuffs by goats and sheep were reviewed. From existing data, conclusions about the comparative utilization of feeds by these species are impeded by a lack of uniformity in experimental conditions. Nevertheless, a hypothesis of differential species advantage is presented which could be tested in future experiments. This hypothesis is based on evidence that species differences in intake and digestibility are relatively unimportant when the diet is relatively low in fiber concentration. On low quality, high fiber diets, sheep tend to digest the dry matter (and fiber) more completely than goats, but their voluntary intake levels tend to be lower.

PB84-244334/GAA PC **A08**/MF **A01**
National Marine Fisheries Service, Little Rock, AR.
National Aquaculture Directory,
J. W. Ayers. Sep 84, 156p* NMFS/M321/84-14

Keywords: *Aquaculture, States(United States), Marine fishes, Shellfish, *Fisheries, Catfishes, Trout, Bass, Salmon, Shrimps, Clams, Carp, Minnows, Shiners, Fresh water fishes, Listings.

National Marine Fisheries Service's first National Aquaculture Directory compiled of private firms engaged in aquaculture. Listings are by state, giving name of firm, address and type of fish and/or shellfish.

PB84-244367/GAA PC **A02**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Utilization of Urea by Sheep and Goats Fed High Roughage Diets.
Technical rept. series,
A. L. Ordoveza, and W. L. Johnson. 1983, 12p TRS-38
Grant AID/DSAN/XII-G-0049
Prepared in cooperation with North Carolina State Univ. at Raleigh.

Keywords: *Nutrition, *Ruminants, Diets, Urea, Farm crops, Residues, Nitrogen, Proteins, Digestion(Biology), Soybean oil, Statistical analysis, Tables(Data), Developing country application.

Two experiments were conducted to test the utilization of urea-containing high fiber diets by small ruminants. In Experiment I wheat straw/alfalfa hay diets were supplemented with 0, 1 or 2% urea to achieve 7, 10 or 13% crude protein equivalent. When fed to growing Toggenburg wether goats, voluntary intake was slightly lower (P.05) for the diet without urea. Digestibilities of dry matter and fiber (P .05) and crude protein (P .01) were lower for the diet without urea but not different for the diets with 1 or 2% urea. Less nitrogen was retained (P .01) on the zero-urea diet, with no difference between the 1 or 2% urea diets. In Experiment II urea was compared with soybean oil meal as a nitrogen source in low or medium fiber diets for growing, wethered Toggenburg goats or Suffolk sheep. All diets were adjusted to 11-12% crude protein equivalent.

PB84-244383/GAA PC **A03**/MF **A01**
Agency for International Development, Washington, DC.
Food Aid and Development: A Policy Discussion Paper.
Jul 81, 38p AID-PN-AAK-372

Keywords: *Food, *Agricultural economics, Food, Production, Marketing, Distribution(Property), Government policies, Grants, Revenue, Developing country application, Macroeconomics.

Food aid (FA) can have a positive, long-term impact on development only in the context of a broadly-based agricultural development strategy aimed at providing equity to poor farmers. Against a background discussion of this principle, this paper discusses measures that need to be examined to ensure that FA will in fact complement such an equitable growth strategy and sets forth corresponding program implications for A.I.D. Specific measures discussed are agricultural production incentives; market interventions by the government; agricultural price stabilization, food reserves; and direct food distribution.

PB84-244417/GAA PC **A03**/MF **A01**
International Statistical Inst., Voorburg (Netherlands).
Preferences for Number and Sex of Children and Contraceptive Use in Korea.
Scientific rept. no. 22,
N. I. Kim, and B. M. Choi. Jun 81, 33p AID-PN-AAK-268
Contract AID/csd-3606
Prepared in cooperation with World Fertility Survey, London (England).

Keywords: *Contraceptives, *South Korea, *Children, *Birth control, Statistical data, Marriage, Developing countries, Fertility, Developing country application.

Women's desires to have a certain number of children-or more specifically, a certain number of sons and/or daughters-can provide strong motivation for their use of contraception. This report uses data on 3,907 married, fecund, and nonpregnant Korean women obtained from the 1974 Korean National Fertility Survey to examine the consistency between respondents' answers and their fertility preferences; the determinants of fertility preferences; and the relationship between fertility preferences and contraceptive use.

PB84-244540/GAA PC **A06**/MF **A01**
Michigan Univ., Ann Arbor. Center for Research on Economic Development.
West African Pastoral Production Systems. Working Paper Number 3 of Livestock Production and Marketing in the Entente States of West Africa,
J. Swift. Feb 79, 120p AID-PN-AAK-101
Contract AID/afr-C-1169
Prepared in cooperation with Sussex Univ. (England).

Keywords: *West Africa, *Livestock, Environmental impacts, Social effect, Production control, Land use.

An adequate typology of West African pastoralism is lacking. This paper presents and utilizes such a typology to describe the main pastoral production systems of dry West Africa. Unlike previous classifications based on the degree or pattern of movement among pastoralists, the author's typology is based on four variables-environment, sociocultural tradition, source of livelihood, and the degree to which production is marketed. The author proceeds to detail the contributions to production of land, technology, herd characteristics, and labor.

PB84-244557/GAA PC **A04**/MF **A01**
Department of Agriculture, Washington, DC.
Starting a Farm Management and Farm Record Program in Tunisia,
W. F. Litwiller, M. Guellouz, and R. Stiles. Aug 81, 55p AID-PN-AAK-360
Prepared in cooperation with Tunis (Tunisia), and Peace Corps, Washington, DC.

Keywords: *Agricultural extension services, *Farming, *Tunisia, Education, Farms, Questionnaires, Records management, Expenses, Livestock, Milk, Inventories, Cattle, Forage grasses, Production, Income, Developing country application.

Modern farm planning and management methods are new and poorly understood by most small farmers in Tunisia. This report describes an extension farm management program designed to address this problem. The program, based on a view of the farm as a technically well-managed and economically sound unit, received technical assistance from A.I.D., and targeted farmers with less than 20 ha who raise cattle but cultivate little forage. In its first year, the program was limited to three farms. The program was extended to 54 farms in 1980-81, but many farmers quit because they disliked recordkeeping and had mistakenly expected the program to provide forage seeds and other materials. Nonetheless, the program had a marked impact - both bersim and milk production were far above average, per capita income of participating farmers was slightly above the national average, and the most successful farmers in the program earned twice the national average.

PB84-244573/GAA PC **A25**/MF **A01**
Lyon Associates, Inc., Baltimore, MD.
Tanzania Rural Roads Feasibility Study. Volume 1. Technical and Economic Aspects.
Final rept.
12 Oct 81, 595p AID-PN-AAK-015
Contract AID-afr-C-1605
See also PB84-244581. Prepared in cooperation with Snitzler (James R.) Associates, Inc., Camp Springs, MD.

Keywords: *Economic analysis, *Roads, *Rural areas, *Tanzania, Developing countries, Construction, Renovating, Planning, Maintenance, Developing country application, Kilimanjaro Region(Tanzania).

A major impediment to Tanzania's rural development efforts has been the poor condition of its rural roads which restricts access to social services and markets. The objectives of this study are to assist in the construction or rehabilitation of roads in the Dodoma and Singida regions and the Same and Mwanga districts of the Kilimanjaro region and to provide these districts with the ability to maintain roads by improving their administrative, planning, construction, and maintenance capacities. This volume deals solely with the technical and economic aspects of the study.

PB84-244581/GAA PC **A03**/MF **A01**
Lyon Associates, Inc., Baltimore, MD.
Tanzania Rural Roads Feasibility Study. Volume 2. Training Requirements.
Final rept.
1981, 34p AID-PN-AAK-016
Contract AID/afr-C-1605

See also PB84-244573 and PB84-244599. Prepared in cooperation with Snitzler (James R.) Associates, Inc., Camp Springs, MD.

Keywords: *Roads, *Rural areas, *Tanzania, Developing countries, Construction, Renovating, Planning, Maintenance, Developing country application, Kilimanjaro Region(Tanzania), *Training, Training objectives.

This second volume of the feasibility study of road construction and rehabilitation in Tanzania presents a training program to develop a quantitatively and qualitatively adequate Tanzanian work force to rehabilitate the road system in the rural road improvement (RRI) area, and to maintain the road system after rehabilitation.

PB84-244599/GAA PC **A05**/MF **A01**
Lyon Associates, Inc., Baltimore, MD.
Tanzania Rural Roads Feasibility Study. Volume 3. Environmental Assessment.
Final rept.
1981, 83p AID-PN-AAK-017
Contract AID/afr-C-1605
See also PB84-244581. Prepared in cooperation with Snitzler (James R.) Associates, Inc., Camp Springs, MD.

Keywords: *Roads, *Rural areas, *Tanzania, *Environmental impacts, Developing countries, Construction, Renovating, Planning, Maintenance, Social effect, Economic impact, Developing country application, Kilimanjaro Region(Tanzania).

This third volume of the Tanzanian Rural Roads Feasibility Study assesses the environmental impact of the proposed Rural Road improvement (RRI) Project.

PB84-244961/GAA PC **A06**/MF **A01**
Michigan State Univ., East Lansing. Dept. of Agricultural Economics.
Econometric Analysis of Supply Responsiveness in Traditional Agriculture: Millet, Sorghum and Rice Farmers in Mali.
Working paper,
B. Sako, and R. W. Cotterill. Jun 81, 104p AERP/WP-36, AID-PN-AAK-376
Contract AID/afr-C-1267

Keywords: *Econometrics, *Grains(Food), *Agricultural economics, *Mali, Economic models, Prices, Grain sorghum, Rice, Sales, Government policies, Social welfare, Supply(Economics), Developing country application, Millet.

The Government of Mali's twin goals of reestablishing the country's position as a net grain exporter and maintaining reasonable domestic grain prices may be incompatible. This paper analyzes data for the period 1960-79 in order to examine Malian farmers' supply responsiveness and the welfare effects of government grain pricing policies.

PB84-245075/GAA PC **A09**/MF **A01**
Arizona Univ., Tucson. Office of Arid Lands Studies.
Draft Environmental Profile on Rwanda,
Aug 81, 182p AID-PN-AAK-035
Contract NPS-CX-0001-0-0003

Keywords: *Environmental impacts, *Ecology, Agriculture, Forests, Erosion, Population growth, Natural resources, Animal ecology, *Rwanda, Energy sources, Resource management, Developing country application, Africa.

With its rapid population growth and limited natural resources, Rwanda faces a number of serious environmental problems according to this draft report on the country's geography, climate, demography, geology, mineral and energy resources, soils, water resources, and flora and fauna. Rwanda has a diverse but fragile tropical ecology and its climate and rainfall are adequate for two growing seasons. However, Rwanda's landlocked location, total dependence on agriculture, and lack of mineral resources adversely affect development efforts.

PB84-245240/GAA PC **A08**/MF **A01**
Utah Agricultural Experiment Station, Logan.
Tables of Feed Composition for Indonesia (Tabel-Tabel Dari Komposisi Bahan Makanan Ternak Untuk Indonesia),
H. Hartadi, S. Reksohadiprodjo, S. Lebdosukojo, and A. D. Tillman. Nov 80, 157p AID-PN-AAK-406
Contract AID/ta-C-1159
Text in English and Indonesian.. Prepared in cooperation with Rockefeller Foundation, New York.

Keywords: *Animal feeds, *Indonesia, Vitamins, Amino acids, Describing, Food additives, Diets, Developing country application.

While significant information exists on feedstuffs used in Indonesia, it is scattered among many publications, making retrieval and correlation difficult. The purpose of this publication is to present a single source of nutrition information on the composition of Indonesian feeds and mineral supplements and on the mineral, vitamin, and amino acid content of selected feeds. While the availability of nutrition data on Indonesian feed is limited, the document does serve as a basis for describing feeds and identifying future research needs.

PB84-245299/GAA PC **A11**/MF **A01**
American Public Health Association, Washington, DC. International Health Programs.
AID (Agency for International Development)-Assisted Primary Health Care Projects: Summary Reviews.
1981, 226p AID-PN-AAK-351
Contract AID/DSPE-C-0053

Keywords: *Latin America, *Health, *Health care delivery, *Project evaluation, Project management, Financing, Asia, Latin America, Africa, Caribbean Islands, Near East, Developing country application.

A.I.D. is one of the major sources of external support for primary health care (PHC) programs aimed at increasing the availability of basic health services in developing countries. In this report, 52 A.I.D.-assisted projects are described in order to provide an overview of the Agency's PHC activities and a framework for tracking progress and problems in project implementation. The projects are listed alphabetically by country according to four regions: Asia, Latin America and the Caribbean, Africa, and the Near East.

PB84-245307/GAA PC **A04**/MF **A01**
Virginia State Univ., Petersburg.
Supply Responses of Cotton Farmers in Ghana: Case Study of Northwestern Ghana.
Monograph series,
R. Ohene-Darko, and J. Anim-Appiah. 1984, 53p AID-PN-AAK-278
Contract AID/CSD-3415, Grant AID/DSAN-XII-G-0185
Prepared in cooperation with University of Science and Technology, Kumasi (Ghana). Sponsored in part by Grant AID/DSAN-G-0612.

Keywords: *Cotton, *Agricultural economics, *Ghana, Surveys, Economic models, Risk, Decision making, Prices, Supply(Economics), Credit, Competition, Area, Farms, Trends, Tables(Data), Developing country application.

Domestic cotton production in Ghana is meeting only 20% of demand. This report describes a socioeconomic survey of farmers in the Wa area of northwestern Ghana and applies survey data to an economic model of factors affecting farmers' decisions to grow cotton. Against overviews of the history, importance, and problems of cotton production in Ghana, the authors present the findings of their survey of Ghana's foremost cotton growing area. Credit is the major bottleneck. Thus, up to 85% of farmers rely on personal savings to finance their farm operations; the remainder borrow from friends, family, and moneylenders. Risk aversion is the most salient characteristic of farmers' decisionmaking.

PB84-245323/GAA PC **A11**/MF **A01**
Practical Concepts, Inc., Washington, DC.
Urban Functions in Rural Development: Final Report of a Field Demonstration in Fada N'Gourma and Koudougou Regions of Upper Volta, 1978-1980,
S. M. Fass, and E. Pare. Jun 81, 244p AID-PN-AAK-356
Contract AID/SOD/PDC-C-0154
Prepared in cooperation with Ministry of Rural Development, Ouagadougou (Upper Volta).

Keywords: *Rural areas, Recommendations, Social effects, *Agricultural economics.

A.I.D.'s Urban Functions in Rural Development project in Upper Volta is aimed at identifying ways to promote rural development by improving the effectiveness of service functions in central villages or towns. To this end, the project undertook to identify over 50 central services provided in 1,300 villages and centers; to analyze them in some detail in 108 settlements; and with local help to evaluate performance in 44 selected centers comprising the most significant villages and the bulk of available functions. This final project report provides an overview of the economy, agriculture, and population of Upper Volta; an analysis of agriculture, population, settlement patterns, and rural development functions in the eastern and center-west regions; a summary of the project's findings; and recommendations for enhancing local government service capabilities.

PB84-245331/GAA PC **A07**/MF **A01**
Development Alternatives, Inc., Washington, DC.
Evaluating Small-Scale Enterprise Promotion: State-of-the-Art, Methodologies and Future Alternatives,
S. G. Goldmark, and J. Rosengard. May 81, 148p AID-PN-AAK-355
Contract AID/DS-C-OTR-0016

Keywords: Surveys, *Information systems, *Small businesses, Program evaluation, Comparative evaluations, Test methods, Economic impact, State of the art, Developing country application.

As part of a project to develop a handbook to evaluate the impact of small-scale enterprise (SSE) projects, this state-of-the-art paper reviews methodologies currently used in evaluating SSE projects. After defining common terms of reference for SSE practitioners, the author reviews the key determinants of SSE evaluation methodologies (level and users of and data bases for evaluation; budgetary and timing parameters) and points out the need to examine the trade-offs between these determinants critically. An analytical framework for assessing the impact of SSE's, focusing on the development hypotheses underlying SSE projects and the hierarchy of impacts (on enterprises, on the community, and on benefit and cost distribution), is delineated, as are linkages within the hierarchy. Alternative SSE evaluation methodologies are examined in terms of their functional components (indicators of an SSE project's direct impact on an enterprise's profitability and sustainability and on community income and employment; data collection techniques; and methods of data analysis). Stress is given to: the importance of indicators of why the project was helpful or not; its qualitative effect on the enterprise; and enterprise-community interaction. Suggestions are made to improve formal and informal data collection techniques. A detailed plan of action for follow-on field work in four countries is presented. Appendices detail the U.S. institutions and the literature reviewed (101 items, 1964-80) for the study, and include abstracts of 10 SSE impact evaluations.

PB84-245349/GAA PC **A03**/MF **A01**
Agency for International Development, Washington, DC.
Indicators of Food and Agriculture in AID (Agency for International Development) Assisted Countries.
Statistical profile series.
Jun 81, 28p AID-PN-AAK-275

Keywords: *Agricultural economics, *Productivity, Production, *Food, Supply(Economics), Nutritive value, Grains(Food), Proteins, Land use, Farms, Populations, Irrigation, Agricultural machinery, Manpower, Tables(Data), Developing country application.

Intended as a handy reference manual for A.I.D. personnel, this report draws on data sources from major international organizations such as the World Bank, the U.N. Food and Agriculture Organization, and the International Monetary Fund, to present a statistical profile of agricultural development in AID-assisted countries. A total of 28 indicators in nine classes are provided. Agricultural Production indicators include average annual growth rate of total production and annual production as a percentage of total domestic production.

PB84-245356/GAA PC **A03**/MF **A01**
Agency for International Development, Washington, DC.
Women in Development - Access of Rural Girls to Primary Education in the Third World: State of Art, Obstacles and Policy Recommendations,
C. Safilios-Rothschild. Oct 79, 35p AID-PN-AAK-282

Keywords: *Education, *Women, Urban areas, Rural areas, Recommendations, Instructors, Schools, *Socioeconomic status.

Although primary education is a prerequisite for higher education and thus for upward social mobility, in most developing countries rural girls' access to primary schools lags far behind that of rural boys and urban girls. Against a statistical picture of women's literacy and access to education, this report examines the importance to girls of an elementary education, describes the determinants of rural female education, and presents policy recommendations.

PB84-245380/GAA PC **A03**/MF **A01**
International Statistical Inst., Voorburg (Netherlands).
Factors Affecting Contraceptive Use in Peninsular Malaysia.
Scientific rept. no. 23,
T. N. Peng, and I. Abdurahman. Nov 81, 30p AID-PN-AAK-335
Contract AID/csd-3606
Prepared in cooperation with World Fertility Survey, London (England).

Keywords: *Contraceptives, *Birth control, *Malaysia, *Family planning, Ethnic groups, Developing countries, Surveys, Developing country application.

The extent of contraceptive use among Malaysian women is encouraging and indicates a growing awareness of the benefits of family planning. This is the conclusion of the study on the determinants of contraceptive use in Peninsular Malaysia. The report includes 19 tables of data and a list of six references (1971-79).

PB84-245398/GAA PC **A06**/MF **A01**
Agency for International Development, Washington, DC.
Assessment of West African Agricultural Development,
W. D. Bair, J. Dorman, M. Duffy, D. Hess, and T. Mukherjee. Dec 81, 109p AID-PN-AAK-129

Keywords: *Agricultural economics, *West Africa, *Farming, Farms, Production, Food, Imports, Economic forecasting, Income, Manpower, Cost analysis, Transportation, Recommendations, Developing country application.

Despite the high level of economic assistance provided West Africa over the past 20 years, the region has failed to halt or reverse the trend of declining food output per capita. This report assesses the region's farm sector, highlights key food production issues, and make suggestions for improving the effectiveness of agricultural development programs. The authors proceed to describe the factors associated with low agricultural output: food import projections; urbanization and income growth; low investment in research, training, and extension; low land and labor productivity; ecological degradation; and prohibitive transportation costs.

PB84-245406/GAA PC **A05**/MF **A01**
Idaho Univ., Moscow. Postharvest Inst. for Perishables.
Perishable Postharvest Losses in Selected Eastern Caribbean Countries: Causes and Recommendations,
D. Leeper, R. Schermerhorn, and D. Jackson. Oct 81, 82p AID-PN-AAK-114
Contract AID-DSAN-CA-0265

Keywords: *Marketing, *Agricultural economics, *West Indies, Food, Losses, Distribution systems, Economic impact, Agricultural products, Prices, Quality, Farm crops, Planting, Harvesting, Barbados Island, Saint Vincent Island, Saint Lucia Island, Dominica Island, Developing country application, Overproduction.

Postharvest food loss, intertwined with the overall marketing and distribution systems, is a serious problem in the eastern Caribbean. This report, based on visits to St. Vincent, St. Lucia, Dominica, and Barbados, explores the determinants of crop loss in the context of the larger marketing and distribution systems and identifies interventions with potentially broad economic impact.

PB84-245414/GAA PC **A03**/MF **A01**
Agency for International Development, Washington, DC.
Some Aspects of Fertilizer Use by Small Farmers: A Review,
B. Sen. Aug 81, 33p AID-PN-AAK-134

Keywords: *Fertilizers, *Agricultural economics, *Farming, Technical assistance, Surveys, Developing countries, Estimates, Distribution(Property), Demand(Economics), Tables(Data), Developing country application.

Critics have charged that fertilizer assistance programs unduly benefit large farmers at the expense of small farmers and that proponents of such programs sidestep the issue of equitable fertilizer distribution. This report reviews the findings of two surveys in India, the National Sample Survey and a National Council of Applied Economic Research survey, to analyze the directional tendencies underlying fertilizer distribution. The author points out that small farmers may, as development literature suggests, use fertilizer intensively in order to maximize output and income from their tiny holdings.

PB84-245448/GAA PC **A04**/MF **A01**
Agency for International Development, Washington, DC.
Production Credit and Fertilizer Consumption: A Review of Literature,
B. Sen. Sep 80, 54p AID-PN-AAK-133

Keywords: *Agricultural economics, *India, Production, Organizations, Banking business, Fertilizers, Demand(Economics), Developing country application, Institutions.

This report reviews the relevant literature generated by the Indian Government since 1976 in order to determine the current system's adequacy in supplying short-term agricultural production credit. The author analyzes the relationship between credit and fertilizer consumption and finds some support of the government's premise that lack of credit is the primary constraint to fertilizer consumption.

PB84-245455/GAA PC **A07**/MF **A01**
Tufts Univ., Medford, MA.
Investments in Large Scale Infrastructure: Irrigation and River Management in the Sahel.
Final rept.,
J. D. Stryker, C. H. Gotsch, J. McIntire, and F. C. Roche. Jan 81, 126p AID-PN-AAK-258
Contract AID/afr-C-1130
Prepared in cooperation with Stanford Univ., CA. Food Research Inst.

Keywords: *Irrigation, *Subsaharan Africa, *Sahel, Investments, River basin development, Stream flow, Project planning, Technical assistance, Cultivation, Economic factors, Benefit cost analysis, Feasibility, Developing country application, Sahel Region(Africa).

To determine whether large-scale irrigation infrastructure projects (IIP) in the Sahel are consistent with the Congressional mandate that A.I.D. projects benefit the poor majority, this report reviews existing IIP's and the Sahel's current irrigation needs because of the mandate's legislative history. The U.S. Congress, it is argued, is willing in principle to finance large-scale IIP's in the Sahel if it can be shown that no better alternatives exist. A review of current irrigation systems and needs for river flow regulation in each Sahelian country and major river basin indicates that the potential for expanding rainfed agriculture and small-scale irrigation - development of which must begin now - is best in Chad, Mali, and Upper Volta and poorest in Mauritania and Niger, with the Gambia and Senegal holding intermediate positions.

PB84-245463/GAA PC **A16**/MF **A01**
Tufts Univ., Medford, MA.
Analysis of Selected Agricultural Parastatals in the Ivory Coast,
E. R. Hermann. Jun 81, 368p AID-PN-AAK-126
Contract AID/REDSO/WA-79-177

Keywords: *Agricultural economics, *Rural areas, *Cotton, *Ivory Coast, Risk, Farm crops, Coffee, State government, Corporations, Prices, Conflicts, Efficiency, Social welfare, Government policies, Decision making, Cultivation, Marketing, Performance evaluation, Developing country application, Ivory Coast Region(West Africa), Oil palm, Cocoa.

Because the Ivory Coast has relied heavily on parastatals (quasi-state corporations) in successfully expanding its agricultural sector, it provides an illuminating subject for this study of the economic efficiency of agricultural parastatals. After background sections on parastatal theory and on the government's dominant role in the Ivory Coast's agricultural development, the author presents case studies of the cotton, oil palm, coffee, and cocoa parastatals and suggests ways to improve their efficiency.

PB84-245471/GAA PC **A07**/MF **A01**
Boston Univ., MA. Health Policy Inst.
Primary-Care Health Centers: A Guide to Planning and Design with Limited Resources,
W. J. Bicknell, E. M. Connor, and S. M. C. Shaw. Jan 82, 147p AID-PN-AAK-113
Contract AID/DSPE-C-0085
Prepared in cooperation with Metcalf and Associates, Boston, MA.

Keywords: *Health, Guidelines, Developing countries, Coordination, Health care, *Health planning, Developing country application.

It typically happens either that primary health care (PHC) programs are planned without considering the factors that influence building design or that PHC buildings are erected without considering the programs they are meant to serve. To help alleviate this problem, this guide provides a clear, succinct framework for planning PHC services along with the centers to house them. Emphasis is placed on the need for a team effort between program planners (doctors, nurses, midwives, officials, etc.) and building designers (architects and engineers, etc.) and on avoiding problems arising from inadequate assessment of needs, poor communication, failure to consider operating costs and space requirements, and insensitivity to local customs and political factors.

PB84-245489/GAA PC **A20**/MF **A01**
Swarthmore Coll., PA.
Food Aid: The Political Economy of International Policy Formation,
R. F. Hopkins. Sep 80, 475p AID-PN-AAK-265
Grant AID/otr-G-1672

Keywords: *Economic development, *Food, Trends, History, Distributing, Benefit cost analysis, Allocations, Supply(Economics), Government policies, United States, Political objectives, Kenya, Egypt, Tanzania, Egypt, Developing country application.

What principles have and should guide the giving and accepting of food aid. This report seeks to answer this question by describing current food aid flows, with special reference to the United States; explaining trends in food aid over the past 30 years; and proposing steps to improve food aid's effectiveness as a development tool. The author traces the history of food aid from the 1950's to 1980's and notes several trends-an increasing number of donors dispersing a falling volume of aid, changes in donor motivation from surplus disposal to development promotion. The author argues that donors should: become more reliable food aid suppliers; base allocation more on need.

PB84-245703/GAA PC **A07**/MF **A01**
National Rural Center, Washington, DC.
Directory of Small Farms Technical Assistance in the United States,
H. T. Baker, R. Blobaum, D. G. Caye, V. M. Caye, and J. P. Madden. Mar 81, 136p AID-PN-AAK-338
Contract AID/DSAN-C-0244

Keywords: *Agricultural economics, *Farming, United States, Organizations, Universities, National government, State government, *Technical assistance, Developing country application, Government agencies.

The strategy of increasing agricultural production in developing countries through use of improved seed and sophisticated techniques has neither increased incomes nor improved nutrition among the rural poor. This directory identifies American organizations and projects with expertise appropriate to the needs of limited-resource farmers in the developing world. The 96 entries in the directory include land grant and other institutions of higher learning, federal and state government agencies, and private organizations.

PB84-245711/GAA PC **A06**/MF **A01**
Evaluation Technologies, Inc., Arlington, VA.
Bolivia: A Country Survey.
Feb 78, 105p AID-PN-AAK-296
Contract AID/SOD/PDC-C-0283

Keywords: *Bolivia, *Disasters, Sociology, Government policies, International relations, Developing countries, Profiles, Civil defense, Disaster relief, Developing country application.

General sociocultural information is provided, along with a brief description of national and regional government organizations, a list of key political figures and international treaties, and a history of recent events. An assessment of Bolivia's disaster preparedness includes an outline of the Government of Bolivia's (GOB) National Civil Defense Plan which sets forth types and phases of disasters and lines of national and provincial authority for emergency procedures; assigns functions such as relief supplies and communications to members of the GOB Disaster Relief Committee; addresses public order, evacuation, public health and medical services (treatment priorities, epidemiological and sanitary concerns, rodent control, corpse disposal, and health education), transport logistics, communications; and provides disaster planning for earthquakes, brush and forest fires, and flooding.

PB84-245737/GAA PC **A05**/MF **A01**
California Univ., Davis. Small Ruminant Collaborative Research Support Program.
Comparative Anatomy of the Digestive Tract in Cattle Sheep and Goats: A Review.
Technical rept. series,
J. M. Luginbuhl. 1983, 90p TRS-40
Grant AID/DSAN/XII-G-0049
Prepared in cooperation with North Carolina State Univ. at Raleigh.

Keywords: *Ruminants, Anatomy, Developing country application.

Knowledge of comparative anatomy is a necessity for scientists whose research involve food-producing animals. This study attempts to review and compare the available information on the digestive tract anatomy of sheep, goats and cattle. Coordinated motor activities of the forestomach related to rate of passage of digesta are also examined. Although genuine differences exist, data used to describe the anatomy of the digestive tract of domestic ruminants is mainly derived from cattle and to a lesser extent from sheep. Goats have received the least study. In addition, the complex compound stomach of domestic ruminants has long been a source of curiosity and consequently less information concerning the other parts of the digestive tract is available.

PB84-245778/GAA PC **A99**/MF **E04**
Central Statistical Office, Port of Spain (Trinidad and Tobago).
Trinidad and Tobago Fertility Survey, 1977. Country Report. Volumes 1 and 2.
1981, 749p AID-PN-AAK-339
Contract AID/csd-3606
Prepared in cooperation with World Fertility Survey, London (England).

Keywords: *Trinidad, *Tobago, *Fertility, *Demography, Developing countries, Demographic surveys, Statistical data, Developing country application.

Against a socioeconomic and demographic description of the population of Trinidad and Tobago, the authors summarize how the Survey of 4,359 women was conducted - its administration and staffing, sample and questionnaire design, organization of the pretest and the main Survey, editing and coding of data, data processing, quality control, and response rates. The substantive findings of the Survey are presented regarding the age, ethnicity, and residence of the sample population; mating patterns and exposure to childbearing; initial, recent, and cumulative fertility; preferences for number of children; knowledge and use of contraception; and the relationship between contraception and fertility preferences.

PB84-245786/GAA PC **A18**/MF **A01**
Institute for Development Anthropology, Binghamton, NY.
Development Potential of New Lands Settlement in the Tropics and Subtropics: A Global State-of-the-Art Evaluation with Specific Emphasis on Policy Implications,
T. Scudder. Oct 81, 420p AID-PN-AAK-357
Grant AID/DSAN-G-0140

Keywords: *Economic development, *Agricultural economics, *Tropical regions, Management, Population migrations, Socioeconomic status, Farms, Production, Government policies, Political objectives, Indonesia, Malaysia, Nepal, Risk, Farm crops, Livestock, Philippines, Somali, Sri Lanka, Sudan, Developing country application, Global, Ownership, *Land use.

This state-of-the-art analysis is designed to improve the design, implementation, management, and evaluation of future new lands settlement. Against background descriptions of types of settlers and settlements and definitions of settlement success, the author presents the method by which he prepared his study - a review of the literature and field visits to Indonesia, Malaysia, Nepal, the Philippines, Somalia, Sri Lanka, and Sudan. The dynamics of and the issues to be addressed during the four stages of new lands settlement are detailed.

PB84-246347/GAA PC **A07**/MF **A01**
WWI Consulting Engineers, Emeryville, CA.
Technology Assessment of Aquaculture Systems for Municipal Wastewater Treatment,
H. C. Hyde, R. S. Ross, and L. Sturmer. Aug 84, 133p* EPA/600/2-84/145
Contract EPA-68-03-3016
Prepared in cooperation with Humboldt State Univ., Arcata, CA.

Keywords: *Aquaculture, *Sewage treatment, Feasibility, Economic factors, Technology assessment, Aquatic plants, Aquatic animals, Sites, Ponds, Accumulation, Cost effectiveness, Odors, Public health, Design, Recovery, Biomass, Cost comparison, Tables(Data), Water hyacinths.

The innovative and alternative technology provisions of the Clean Water Act of 1977 (PL 95-217) provide financial incentives to communities that use wastewater treatment alternatives to reduce costs or energy consumption over conventional systems. Some of these technologies have been only recently developed and are not in widespread use in the United States. This document discusses the applicability and technical and economic feasibility of using aquaculture systems for municipal wastewater treatment facilities.

SERI/RR-8228-1/GAA PC **A10**/MF **A01**
Solar Energy Research Inst., Golden, CO.
Impact of International Financial Institutions on Markets for Solar Energy Systems.
J. F. Day, III, and R. Sacks. Oct 79, 213p
Contract EG-77-C-01-4042

Keywords: *Photovoltaic power system, *Solar energy, Developing countries, Financing, International organizations, Market, ERDA/140300, ERDA/299001.

In support of the International Photovoltaic Program Plan prepared for DOE by SERI, Strategies Unlimited has conducted a study to assess the impact of international financial institutions on the markets for solar electric systems, especially on photovoltaic power systems. This report reviews the sources and uses of funds for economic development in the Third World. The origin of development funds since 1970 is quantified, the channels through which funds reach the developing countries are examined, and the economic sectors within the developing countries where funds are applied are detailed. This report includes a review of the World Bank, principal regional development banks, OPEC institutions, US Export-Import Bank, principal US commercial banks, and the Euro-currency markets of the world as they finance the developing world. Both concessional and nonconcessional transfers are identified, including both official and private sources. Development bank loan practices are reviewed, including an analysis of sectors, priorities, and trends. US commercial bank international activities are reviewed including the identification of bank exposure by developing country. The report also discusses selected solar energy projects funded by the development banks. Recommendations are prepared for government policy to accelerate the widespread use of photovoltaic systems in international markets. (ERA citation 05:008239)

SERI/TR-744-450/GAA PC **A03**/MF **A01**
Solar Energy Research Inst., Golden, CO.
Decentralized Energy Studies: Compendium of U.S. Studies and Projects.
J. Quinn, and J. M. Ohi. Jun 80, 47p
Contract AC02-77CH00178

Keywords: *Energy, *Renewable energy, Appropriate technology, Communities, *Energy conservation, Energy source development, Energy sources, Local government, Power supplies, Regional analysis, Research programs, Solar energy, State government, ERDA/299000, ERDA/140400.

This compendium was prepared as a part of the Decentralized Energy Studies task at the Solar Energy Research Institute. The compendium lists and briefly describes a number of studies, programs, and projects that involve decentralized energy systems. The purpose is to provide information about research activities in decentralized energy systems to researchers, government officials, and interested citizens. A contact person or address is given for each of the activities listed so that interested readers can obtain more information. (ERA citation 05:030781)

SHR-0009478/GAA PC **A04**/MF **A01**
Boston Coll., Chestnut Hill, MA. Graduate School of Social Work.
Education Cooperative and Its Applicability to Developing Countries.
Marilia Baker, Saray de Veagra, and Patricia Witham. 1980, 64p

Keywords: *Education, Academic education, Administrative support, Arrangements, Communicating, Coordination, Delivery, Direct services, Integration, Interactions, Interrelationships, Management systems, Methodology, Organizing, Services, Social services, Developing countries, Disabled.

This report summarizes the experiences of three graduate students from Latin America at The Education Cooperative (TEC) -- a collaborative effort among 10 Massachusetts school districts -- and discusses the transfer of the knowledge acquired to actual practice in their respective countries. General characteristics of educational collaboratives are detailed, and TEC's history is reviewed. TEC has been involved in promoting greater understanding of regional resources in special education and identifying existing materials, facilities, and programs in member districts. Each graduate student was assigned to a different TEC project: the career education program aimed at integrating classroom knowledge with the world of work; the career opportunities program, an effort to provide career opportunities to junior and senior high school students with developmental disabilities; and a model training program for parents of young children with special needs and professionals who work with these children. The report describes each project as well as the individual intern's activities. It then discusses the replication of these programs in Brazil, Chile, and Panama. Basic information about each country is provided. The final section examines the applicability of the collaborative concept to developing countries. Tables, charts, and references are provided.

SHR-0202301/GAA PC **A03**/MF **A01**
PROJECT SHARE (HEW), Rockville, MD.
Productivity in Human Services: Measurement, Improvement, and Management.
Dec 80, 28p
Human Services Bibliography Series.

Keywords: Administrative support, Arrangements, Communicating, Coordination, Cost analysis, Costs, Criteria, Effectiveness, Evaluation, Forecasting, Measurement, Methodology, Organizing, Services, *Social services, Standards, Systems, Bibliographies, *Productivity.

This annotated bibliography of 32 items presents literature relevant to productivity in human services -- the delivery of services in the most economical, efficient, and effective manner possible. Included is a selected portion of the available documents that deal with basic concepts of work measurement, methods of improvement, effectiveness measurement, time standards, and performance measures. Performance incentive development (monetary and nonmonetary incentives serving as catalysts to increase output) and motivational strategies used to encourage efficiency and effectiveness are also considered. The documents in this bibliography are representative of issues in human services productivity, but are not exhaustive of the extensive documentation available. Information for ordering documents is provided. An alphabetic listing of authors and an index are included.

TID-28830/1/GAA PC **A04**/MF **A01**
Department of Energy, Washington, DC.
Domestic Policy Review of Solar Energy. Volume 1. Final Report, International Panel.
Oct 78, 58p

Keywords: *Solar energy, Bilateral agreements, Budgets, Commercialization, Energy, Energy source development, Financing, Foreign policy, Government policies, International cooperation, Numerical data, Renewable energy sources, Tables, ERDA/299001, ERDA/140400, National government.

The Federal government has a growing number of international activities relating to solar energy. These programs, which are assuming increased importance within the overall context of US foreign policy in energy, derive from different legislative authorities (Section 2) and serve a variety of US interest. Overlapping jurisdictions appear to exist with regard to programs with developing countries. The scope of existing activities is broad, including cooperative arrangements and agreements with both industrial and developing countries in research and development on solar technologies, energy and resource assessments, training in energy management, institutional development and demonstration of solar technologies (Section 3). A brief assessment of major activities is provided in Section 4. (ERA citation 05:005870)

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To date, US solar technology, development, and commercialization have concentrated on domestic needs. The international arena does provide the US with an exceptional opportunity to advance several major foreign policy goals, namely: helping to ease the pressure on world fossil-fuel demand; cooperating with the industrialized countries in meeting the global energy challenge; helping the developing countries to attain greater energy and economic self-sufficiency; and improving the US trade and balance-of-payment. Discussed in detail are three interrelated initiatives, each of which is essential to a successful international effort. The first is commercialization of solar energy abroad by market identificaton and development, to create general world-wide demand and promote international trade, in which all interested countries can participate along with the US. The next is technical cooperation to bring about improvements in solar technologies, especially by developmental and demonstrational projects aimed at creating marketable, commercially viable systems and equipment. Cooperation with developing countries to bring about optimum energy resource development, with the help of appropriate international financial and technical assistance is the third option discussed. (ERA citation 05:005871)

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